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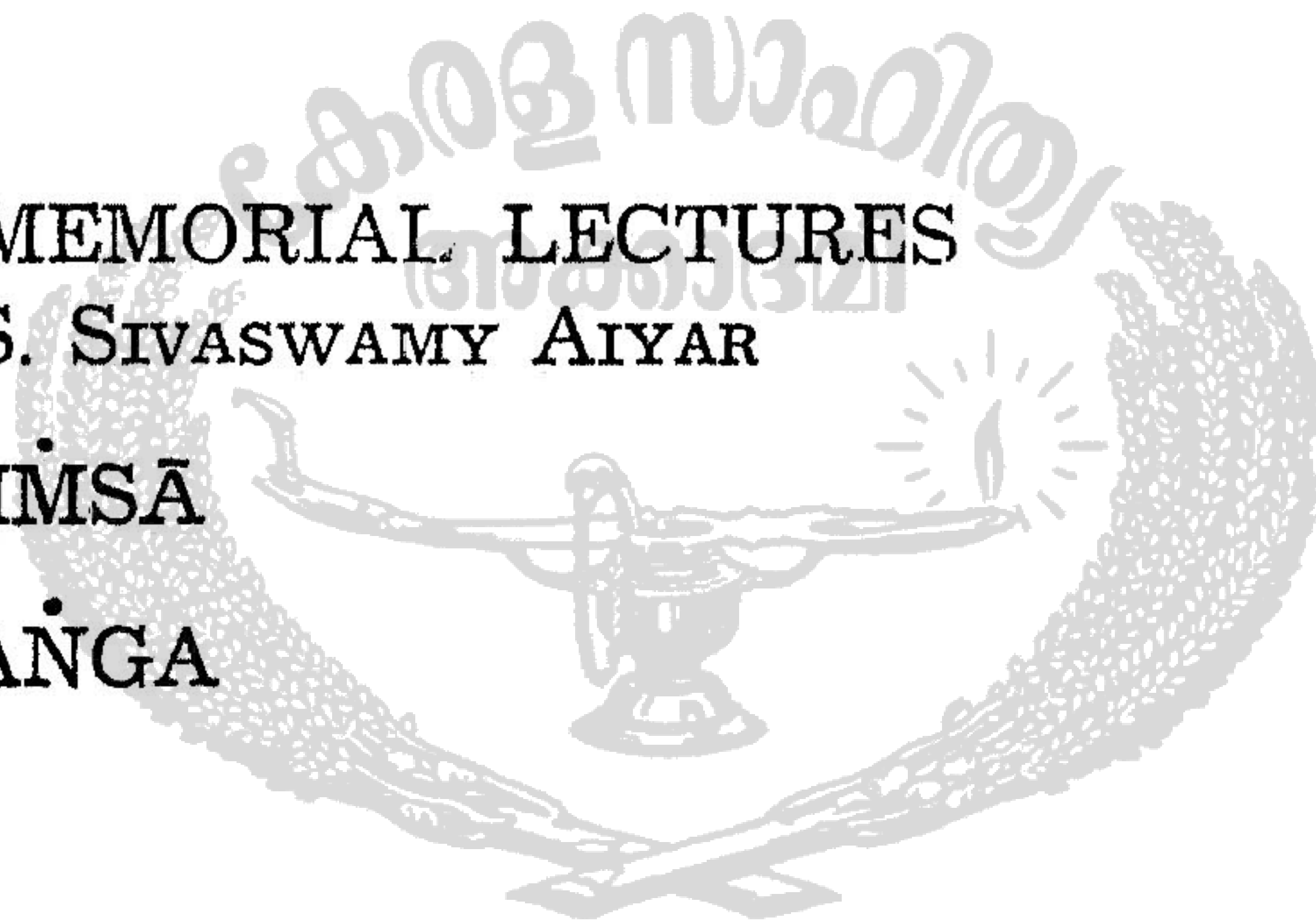


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WORLD ECONOMY AFTER THE WAR.

By

P. J. THOMAS

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The present war is largely one of rival ideologies. Nazi Germany is fighting not merely for *lebensraum* but for the domination of other nations. The world order which the Nazis want to replace is defective in many ways, and this has given some help to Nazi designs. Therefore while we must exert every nerve to defeat the Nazis, we must also give our earnest attention to the building up of a better world order than the old effete one.

The Old Order

The old order evolved as a result of the Industrial Revolution in Europe. With the help of a new industrial technique invented in the latter part of the 18th century, the nations of Europe were able to evolve a new industrial civilization based on mass production and cheap transport, the steam engine being the basis of both. The extensive use of steam ships and railways gave a great impetus to world commerce and ushered in a new international economy. Under it industry flourished in Western Europe and North America, while other lands, mostly in Asia and South America, specialized in the production of raw materials and foodstuffs. England was the pioneer of industry and commerce, but later Germany, France and U.S.A. followed suit. Owing to a fairly general assent on the goal of *laissez faire*, trade over a large part of the world was unhampered by tariffs for long, and therefore there was great prosperity in countries specializing in industry and trade. But all this changed after 1914. By the rising surge of economic nationalism, international trade came to be hampered by tariffs and other barriers. Capitalism came under a serious challenge, led by Soviet Russia. International rivalries became bitter and resulted in the world war of 1914-18; and to-day we are in the midst of a more serious world struggle. The old order is nearly dead.

The world order that is now passing away had several serious defects. Firstly, while the industrialists grew in wealth and power, those who raised primary products did not have any reasonable share in it. Agriculture has always been the Cinderella of the economic system; it has done the dirty jobs, but the profits went largely to industry and trade. As Sir Thomas Middleton bluntly puts it: "Commerce, industry, finance and the services have by skill and organisation used to their own advantage the cheap raw products of the soil." This is borne out by the statistics of income in the different countries. In the U.S.A., a country of large farms, the annual income per head of persons engaged in agriculture is about Rs. 900 and that of persons engaged in industry about Rs. 2,300. Thus the agriculturist obtains only 40% of the industrialist's income. The difference is much wider in countries where agriculture is pursued by peasants, as in India and China. In England, where agriculture plays too small a part, the farmer makes little profit. Even so cautious a statistician as Lord Stamp has hazarded the view that "the world as a whole and over a given length of time has been fed below cost price for the last 100 years, if one takes into account the proper elements of cost." This was perhaps due to the lack of effective organisation among agriculturists and to the inelasticity of the supply of primary products, but there it is. In the result there has grown a yawning gulf between the few wealthy industrial nations and the many impecunious agricultural countries. The average American has an income of Rs. 2,000, but the average Indian has hardly Rs. 80 and the average Chinaman Rs. 60. Therefore while the standard of living went on rising rapidly in the West, it remained fairly steady at the old despicable levels elsewhere, especially in Asia. Thus, India and China which contain nearly half the world's population are still steeped in poverty and misery.

Secondly, even with the prosperous industrial nations, the profits from industry and trade were so unevenly distributed that the masses have remained comparatively poor. In spite of the great prosperity of modern England, half the population is living on inadequate diet, according to recent enquiries, and about a million persons are still unemployed with all the rearmament efforts lately. The international economy gave splendid opportunities to clever organisers and captains of industry; it made some of them multi-millionaires, but the lot of workers remained poor. "Morgan smiles and there is sunshine in millions of homes; Melchett frowns and there is starvation in countless families." This was fit ground

for the growth of Communism on the one hand and Fascism on the other.

The existence of poor but populous nations and the abundance of poverty in wealthy countries placed serious impediments on the onward march of prosperous nations and eventually inflicted a crushing blow on world economy. Large scale industry could only prosper when there is an expanding market, but the market could expand only if the masses obtain a steady supply of purchasing power. This was not possible without a fairly equitable distribution of wealth within nations and between nations. Hence the recurring slumps and the persistent unemployment which have pursued the West for long. The economic crisis of 1929-30 unbalanced world economy, and we cannot prevent its recurrence unless world economy is rebuilt on more equitable foundations. Above all, the purchasing power of the masses in India and China must increase rapidly if economic internationalism is to be set on its feet again. The industrialist believed that he could prosper at the expense of the agriculturist; but it has been demonstrated that this was the height of unwisdom. Industrial nations have to take the agricultural countries along with them if they wish to be prosperous. The great commandment "Thou shalt love thy neighbour as thyself" is not merely for our spiritual good; it is surely needed for our material advantage as well.

In spite of such serious defects, the old world economy would have functioned better and lasted longer had the nations of the West entered into some working understanding among themselves. Some of them held sway over vast territories and this roused the cupidity of others. Germany which always claimed a unique position in Europe has long hungered for a predominant place in world economy; its ambition was baffled in 1918, but it sought to wreak vengeance by forging all the engines of destruction which modern science is capable of and this has resulted in the present titanic struggle. If Germany succeeds, all that is most valuable in the present civilization will be in peril. Germany's designs could have been thwarted, nay aborted, had the nations that value freedom joined together betimes in fraternal effort. But this was not to be. The League of Nations had pious ideals before it, but it had not the slightest power of coercion over its members, and it has failed miserably to avert the crisis. Not only has Germany ruined the freedom of several nations; it now proposes to set up a Nazi system over all Europe and perhaps over the whole world. All those who value freedom have to fight against this, and must fight to a finish.

We now want a new world order. It must defend civilization against aggression from avaricious nations who want to dominate over others. It must ensure the world against recurring slumps and depressions. It must maximize the happiness of the world, even if this would reduce slightly the comforts of the few who are now wealthy. It must raise the standard of living of the masses in all countries and especially among the teeming millions of Asia. Above all, it must ensure a modicum of freedom to individuals and to national groups; for, personal liberty is the most valued of man's possessions. Sovietism and Nazism offer to do many good things, but that they will destroy freedom is certain and this makes both of them a menace to civilized existence.

The remarkable scientific and technological progress in the last one hundred years has made it possible to produce enough commodities so as to enable the whole of the world's population of 2000 millions to live in comfort, but politics has forged powerful barriers against such a consummation. In a world which has shrunk incredibly by the ease of communication and transport, mankind can live happily together, but certain selfish nations who want to dominate over others have set up autarchic systems by conjuring up bogeys like '*lebensraum*' and 'population pressure' and have embarked on a war of aggression. It may be that we will be able to frustrate their designs, but they or others may rise again for the same nefarious designs. Hence the urgent need for all free nations to enter into some friendly alliance for common objects.

Wanted—A Co-operative Order

About the form of this future order, various opinions have been put forward. Whatever be the exact constitution of the new union, certain fundamental principles seem clear.

The union must have a common defence organization, a unified currency system and well-adjusted trade relations. This involves a material sacrifice of national sovereignty. The tiny nation-states of Europe have prized their independence greatly, but recent events show that it is not so easy to keep it intact in these days. Within a short time, Poland, Norway, Denmark, Belgium, Holland and even powerful France have had to lose their national independence. Modern science has perfected the art of warfare, and with its aid a powerful nation which has no faith in international justice and which believes in Machiavellian ethics can overthrow the independence of many nations around it. Hence the futility of

independence in a world like the present. The need of the hour is for a union of free peoples for defending themselves against wanton aggression from outside. A common army, navy and air force will entail economy for all. For the cost of defence, the Union must have power to raise revenues directly. The League of Nations failed because it had only powers of moral coercion and nothing stronger.

The organization must be co-operative in outlook. The motto of co-operation is "All for each and each for all." The free nations must co-operate for their economic progress, because all can attain a higher standard of living, if they work amicably. On the other hand, if they work in competition, some may be better off, but the majority will be worse off; and even those who are better off will not be able to maintain their prosperity for long, as they are sure to fall out among themselves. We have seen this demonstrated in the recent past. In order that the nations may co-operate, the causes of rivalry between them must be removed. The old idea of some countries being industrialists and others being agriculturists must be abandoned. Every country can have some industries after a certain level of development, and every country must also grow a considerable part of its foodstuffs. For the rest, all must depend on external trade. It is possible to reconcile the conflicting interests of various nations, if there is a spirit of give and take. This work must be done by an influential commission set up by the Union authorities. In this way, trade barriers between nations can be gradually removed, and the whole of the union territory can be brought under free trade, to the great advantage of all. With the fall of tariffs, prices also will fall, and this would bring about an immediate rise in the standard of living of the masses.

Within each State also, economic life must be organised more or less on the co-operative basis. Laissez faire or free competition has led to a great deal of economic waste and it has failed in solving the problem of poverty. Under a system of free competition, powerful monopolies are bound to arise and thus defeat the very object of competition. The gulf between rich and poor has thus become wider. Co-operation would provide a far more equitable basis, especially in consumption and in the production requirements of agriculturists. It must be admitted that co-operative production has not been a great success in large-scale industry, and there is still need for private enterprise and State effort, provided these will also be worked in the co-operative spirit. Public utili-

ties must be largely owned by the State or local authorities and over all the key industries, the supervision of the State must be minute and strict. The whole economic system must be worked with a view to toning down inequalities of distribution. As the "Times" of London put it lately, planned consumption must be the motto, and if this is to be a fact, the whole economic life must be shot through and through with the co-operative spirit. The "beggar my neighbour" policy must be crushed both in the international and in the intranational spheres.

In regard to monetary policy, it is not essential that there should be a common currency for all the members of the Union. Each may have its own national currency, provided it is pegged at given values in terms of the notes of an International Bank set up under the control of the Union. Such a Bank will expand or contract its note issue in order to help national monetary policies designed to off-set booms and depressions. It must also operate an international exchange equalisation fund in order to counteract speculative movements of short-term capital.

The Eastern Market Holds the Key

Such a currency system and the co-operative organisation of economic activity will greatly help in preventing booms and slumps, but world economy will not function harmoniously unless the standard of living rises among the poverty-stricken masses of Asiatic countries. This is only possible by giving them steadier employment. Therefore one of the prime objectives of the Union must be a development programme in India and China. This is not to be regarded as a charity concern, but as a safe business proposition. The disequilibrium of world economy to-day is largely due to the lack of purchasing power in the thickly populated countries of Asia, and Western industrialists must welcome this as it will provide a steadily growing demand for their goods. The economic development of the East may obviate its need for ordinary consumption goods (textiles and sugar), but it would create a steady demand for machinery and other capital goods, and subsequently when the standard of living rises, as is bound to, there will also be a growing demand for high-grade consumption goods, which only the West can supply. Many industrialists in the West have realized the possible beneficial repercussions of Eastern industrialization on the West and have welcomed it. Henry Ford was once asked at a dinner what he thought was the way to a stable world recovery. He took his pencil and wrote on the table cloth the

numbers '160', '350' and '400', meaning thereby the potential purchasing power of Russia, India and China.

The importance of the Eastern market will be great, especially in the period immediately after the present war, when a severe depression is bound to arise. The development of the East has therefore to play a great part in the consideration of post-war problems.

For making a beginning in such a co-operative union, we must look to the British Commonwealth of Nations and the U.S.A. The British Empire can by itself make a beginning by transforming the Empire into a federal union. The British Empire is not a contiguous territory, but the British territories in the East are fairly near together. In the light of this, it was wise to have summoned a conference in Delhi of representatives from all the British territories in the East. The object of the Conference, let it be noted, was not merely to develop and co-ordinate their resources for the purposes of the war, but also "to establish some form of permanent liaison arrangement." One would wish this Conference had met a few months earlier. Let us hope that this will be a first step in the formation of a federal union on a wider basis. Such a metamorphosis calls for radical changes in some of the member countries, but it is well worth making in the interests of freedom.

The civilised world is involved in a severe struggle. Science has enabled mankind to provide itself abundantly with all the requisites of well-being and if the affairs of the world are wisely regulated, poverty can be blotted out of all countries. But man's perversity has defeated this purpose and the selfishness of nations is keeping the world poor and backward. It is high time we realized the folly of all this. The present struggle in Europe has already plunged in misery many countries which were formerly prosperous. May we hope that a change of heart will soon come about, that adversity will inculcate virtue and that all peace-loving countries will band themselves together into a union for the effective defence of their territories and for the steady progress of their peoples.

A NEW WORLD ORDER

By

SIR J. C. COYAJI

All great world-wars have been followed by attempts to create some sort of new world order. Thus, after the wars of the French Revolution, the world saw the advent of the Holy Alliance, as well as of a Quadruple Alliance by which the great powers were to meet periodically to discuss matters affecting the peace of the world. After the World War of 1914 a more ambitious attempt for the establishment of a world order was made, and the declared aim was to prevent the rise of new political grievances as well as to remedy economic distress. For obviously the formation of a world order has a political and economic aspect, and so close is the inter-action of these two sides that it is difficult to disentangle them and their effects. The efficient functioning of the mechanism of the world in both these aspects depends upon the recognition of the Co-operative principle both in the international and national spheres and on the political as well as the economic side. The need of the adoption of this principle as the pivot of all political and economic actions is so great that we find all great national leaders of the post war epoch from Wilson to Mussolini paying their homage to it. Looking back from our present position it is strange to find that only eight years ago Mussolini laid down the following dictum as the ideal of the world-policy of that day: "What the situation demands is the free movement of goods, of services, of people, of capital and of credit." Briand amongst the representatives of France and Stresemann speaking for Germany were not less emphatic and eloquent about the importance of having the principle of Co-operation permeating the sphere of world policy.

Defects of the former World Order.

Unfortunately, the attempt made to create a better world order after the Treaty of Versailles failed, and it is difficult to say whether the obstacles proved greater on the political or on the economic side. On the political side the adverse factors were—the isolationist policy of America, the deficiencies and blunders of President Wilson, as well as the persistence of France in a policy of

humbling and weakening Germany. Not only did Democracy prove itself unco-operative and revengeful in its hour of triumph but dogmatic as well; for it struck at the root of the monarchic principle in Austria and Germany. It forgot that for centuries the dynastic connection between the Kings of Europe had given at least some semblance of moral and co-operative character to European politics. It thereby opened the way for the rise to power of irresponsible dictators who had no traditions to guide and control them. It was, indeed, in the field of international policy that Democracy registered its greatest failures. The promising experiment of the League of Nations was ruined because the constituent democracies would not see their way to give up an iota of national sovereignty, of national armed strength or of economic nationalism. The feeble strength of the spirit of Co-operation in the League was manifest when it came to the use of sanctions against an aggressor.

Turning to the *economic* aspect of affairs we find that the post-War efforts to bring about a new world-order scored few successes, though they taught excellent lessons in "how not to do it" which will prove useful when a new experiment in the line comes to be launched. After such a great cataclysm as that of the period 1914-18 a great economic depression was only to be expected, but no systematic and well-thought out policy was adopted in order to minimise its effects. Capitalism which was already declining in vitality and power was progressively controlled and its liberty was curtailed; but no important effort was made to reinvigorate it by introducing economic planning and a conscious and reasoned direction of economic affairs. Much was said about Rationalisation and many books were written on the subject but little was done. It may be true, as Sir William Beveridge has put it, that planning under Democracy is as difficult as breathing under water. Yet difficulties are there to be surmounted. Some countries went as far as appointing Economic Advisory Councils, but no important successes were scored in the sphere of national economic planning.

Indeed, under the unhappy influence of Economic Nationalism the course adopted by nations was the very opposite of what a good idea of sound international planning could have dictated. That great country which was in a position to be the banker of the world, America, abruptly renounced that function of foreign investment which was so essential for a proper conduct of production and distribution throughout the world. France followed the example by withdrawing large amounts of her investment abroad.

As the great creditor countries insisted on raising their tariffs and in keeping out imports a serious maldistribution of gold resulted. The example thus set of selfish economic action proved contagious and economic nationalism soon entered on a course of unwise excesses. Tariff barriers were raised recklessly, national self-sufficiency became a wide-spread ideal and a race for depreciation of currency became the economic fashion. In course of time authoritarian economics supervened with its repertory of highly doubtful methods like rationing of imports, fixation of prices and profits and state guidance or dictation of the course and direction of industry. In such an atmosphere the last hope of general international co-operation was extinguished with the failure of the World Economic Conference.

However, the current tendency to place the largest measure of blame for the present sorry state of world-affairs on the shoulders of Democracy and Capitalism is to be deprecated. Any just survey of the world conditions of the day must emphasise the immense harm done by the spread of Communism during the post-War period and by the rise of a totalitarian state in Russia which formed the crown, the guide and the inspiration of that movement. It is impossible to have a totalitarian state in one country without causing the rise of similar states in neighbouring lands either by a process of reaction or by that of invitation or both. Had there been no Soviet State in Russia there would have been no Fascist state in Italy and Nazi State in Germany. Nothing but the rise of Fascism in Italy could have stayed the flood of Communism in that country. The Nazis in Germany exaggerated and utilized the danger from Communism in order to erect in their own country a state as totalitarian as the one existing in Russia. In fact they bettered their pattern. The capitalists as well as the middle classes in the Continental countries were so alarmed by the spread of Communism that they threw themselves on the mercy of the new dictators. Hence arose an unparalleled concentration of political and economic powers in the hands of these men. Such a concentration of powers had repercussions on the whole economic system of a continent with the result that the banking, the currency and the tariff policies of countries were used for strange purposes never dreamed of before. That Capitalism which had been controlled throughout the whole post-war epoch was now fettered and tied to the chariots of totalitarian masters. In France too the activities of the Front Populaire Government completely alienated the capitalist and bourgeois as well as peasant classes and caused a disruption of

the country both in the economic and political spheres which led to the ignominious downfall of the land. Even in Great Britain, the adoption of the policy of "appeasement" had for its background this fear of the growth of Communism. When Democracy and Capitalism are blamed for the present world disorder, it is but fair to recollect that both were paralysed by this Communistic "terror". Communism might be a noble economic ideal, but it must bear a very large share of the responsibility for the present disastrous state of affairs.

The future World Order

In envisaging the new World Order we must face the preliminary issue whether it will be possible and advisable to retain the Capitalist Economy as against its rival, State Socialism. No doubt the present most exhausting war must put an exhausting and unparalleled strain upon the vitality and resources of our Capitalist Economy. It might also be that countries like Germany, might when defeated in war throw in their lot with Communist Russia; that in other countries, too, during war-time the economic functions of the State will be enormously expanded. Nevertheless, in the long run and for most countries of the world the deciding consideration will be whether the Capitalist Economy utilises the factors of production inefficiently as compared with the State. We might adopt the judgment of such an impartial observer as Mr. Keynes on the matter: "I see no reason to suppose that the existing system seriously misemploys the factors of production which are in use." Consequently "apart from the necessity of central controls", a Capitalist Economy will be found preferable to State Socialism. Still as the process of socialisation will have gone further in some countries than in others we shall do well to assume the existence of a world in which some states are Capitalist whilst others might be arranged according to the degree or measure in which their economy is socialised. Similar distinctions and shades of difference will also be apparent between these states in the matter of economic planning.

It is obvious that any great war forms by itself a school of *Economic Planning*. Planning is after all a question of increase of central control; and we see how such central control of economic life been increased at a stroke even in Great Britain. Of course the lessons learned in war-time are of priceless value when peace supervenes. No one denies that in case of Democracies the task of Economic planning is more difficult than in a classless state like

Russia. For, in the latter case, all classes except one have been liquidated; while in the former, a chief task of planning is to lead to a fruitful co-operation between the various classes. As Prof. Ohlin has emphasised recently, a system of planning is needed which "combines flexibility with the possibility of centralized direction in certain special directions." We have to avoid that species of planning which brings under direct public management the major portions of the spheres of industry and trade and which will result in the diminution of the viability and flexibility of the economic system as well as of individual initiative and other dynamic powers of society. Such a system of planning will mitigate depressions and reduce unemployment as well as poverty. Nor should too much power be vested in bureaucracies under a sound system of national planning; rather the pivot of planning should be an Economic General Staff which is "not allowed to do anything but think about the future and plan for the future." Too often it is thought—mistakenly thought—that in economic planning we have only to follow the example of Russia, with its abrupt changes of principles and policy of planning, its immense mistakes costing millions in money and lives, its incessant accusations and punishments of subordinates for sabotage and its privilege of irresponsibility for the man at the head. It is not that sort of planning that we want in our new World Order.

There is another aspect of Economic Planning to which also considerable importance must be attached—the *planning of Distribution*. Democracy has been working—very slowly, it must be confessed—at securing the ideal of economic justice and of a desirable distribution of property and income. What Democracy can do in the matter of securing such justice is well illustrated by the achievement of Great Britain in the matter of the extension of social services, in that of the extension of Unemployment Insurance and Assistance and in that of the heavier taxation of Incomes and Inheritance. The tempo of progress might have been quicker; but the example of Great Britain shows that "it is possible to arrive at an economic system which gives security of work and social services for all, while giving free play to individual responsibility and to diversities in initiative and talent." Democracy might well be proud of the achievement of her eldest child in this sphere. There is no need to make an absolute equality of income our ideal, for there is no ground for the belief that such equality makes for maximum economic advantage. We have, in fixing the just and proper economic distribution to take account of such factors as the requi-

site supplies of saving for the purposes of war and peace and the necessity of a constantly expanding system of production.

We may now turn to some aspects of *International Co-operation and planning*. Let us take first for consideration the currency problem. Here a compromise between the points of view of Monetary Nationalism and of a fully unified International Currency seems to be advisable in the period directly following the present war. The advantages of an International standard are not to be denied in the important matters of international trade and international movements of capital and flows of money. But immediately after this great war the states will be neither able nor willing to part with their national monetary systems. This, however, does not mean the abandonment of co-operation in the sphere of currency; for it is possible and desirable on various lines, and, indeed, during the past decade several experiments have been made which show that this is the sphere in which international co-operation has unusually bright prospects. Thus the success of what has been termed the "Stabilization system" of currency, which was initiated in Great Britain but which secured acceptance throughout the region termed "Sterlingaria," is at once a sign of the potentialities of currency Co-operation and the high-water-mark of managed money. By the exchange equalization device gold is confined to its true scope of utility as international currency. The Three Power Currency Declaration of 1936 forms another happy precedent and example of international Co-operation in currency affairs. By it Britain, France and America agreed not to secure any competitive advantage by lowering the gold value of thier currencies. A still more promising experiment was the Monetary Alliance between Great Britain and France effected in December 1939 by which the franc-sterling rate was stabilised and a clearing agreement was effected for settlement of transactions between the franc and sterling groups of countries. What has been practicable in the past will also be carried through in future, and a flexible relationship will be maintained between currencies of different countries each being allowed in case of difficulties to alter the external value of its currency. That does not mean necessarily a system of elastic parties. Attention will also no doubt be paid to the promising international development of the Exchange Clearing System which has already yielded so many advantages and promises even more. It is fortunate that the path of international co-operation in currency affairs has been, comparatively speaking, so well trodden in the past and that, in spite of the present great cataclysm, foot-prints have been left which will guide us in the future.

Unfortunately, on the side of International Trade and Tariffs the past shows far fewer examples of that International Co-operation which is so necessary to economic progress. Instead of such co-operation we have seen during the last decade the advent of unusually high Protectionism which might be said to have led to the undoing of the economic integration of the industrial countries. Moreover even such high tariffs have been declining in importance compared to novel devices of trade policy—or rather of economic nationalism—like quotas and exchange restrictions, with the advent of Fascism the autarchic tendencies of nationalists have been greatly exaggerated. In this condition of accumulated hindrances and handicaps we cannot hope for any immediate abolition of tariffs and other nationalistic forms of restriction but must be content to follow the path of gradualism. But even here we are not without a few earlier precedents to cheer us on our narrow and difficult path. Thus we might remember the tariff truce concluded, if even for a short period, on the initiative of Mr. Roosevelt, and the work of the World Economic Conference of 1933. Here again the initiative must come from a great creditor country like the United States; for it is obvious that in the course of the last three decades economic power and leadership have been passing more and more to America. Moreover, we have to note the growing importance of “organised exchange between planned national economic systems”. Thus, while there will be ample scope for national specialization, there will be great room for *planning international trade* so as to make the most of the resources of the world as a whole. In this aspect of foreign trade there will be a practical and welcome supersession of tariffs and other restrictions and hindrances to trade.

But there are other important lines of international co-operation which must claim a place even in a brief summary of that topic. There is, for instance, the thorny and difficult subject of the just and proper *international distribution of raw materials*. Any adequate solution of this problem would need a rationalization of the production as well as distribution of such raw materials under international agreement. It would be necessary to emphasise that facilities should be given to any country to provide itself with raw materials only so far as to meet its demands in peace time. No facilities should be given to any country to lay in supplies for future wars. Nor would that be the only condition precedent to be observed by any country seeking to take advantage of such a scheme of rationalization under impartial international control. It will also have to lower its tariff barriers and to reduce any restrictions that

it might have imposed upon international trade *pari passu* with such reductions in other countries. Even before international co-operation on such a scale can be inaugurated much useful work can be done by way of mere bilateral agreements. As Sir Arthur Salter and others have suggested, the British Government might agree to supply Germany with the raw materials wanted by the latter in exchange for goods produced in Germany on a ratio of exchanges determined by average prices over a sufficiently long period. But, while such bi-lateral agreements form a good introduction, our ultimate aim should be a state of things in which the production and distribution of raw materials in colonies should form a responsibility of the whole world acting on co-operative lines.

Turning our eyes to the *political aspect of the future world order*, we find there too a vast field for the application of the principle of co-operation. For, we shall have to consider how Democracy can rise superior to its own past and tackle the great tasks lying before it. Fortunately, co-operation is of the very essence of Democracy, and, indeed, Democracy is best defined as government by co-operation. Democracy has yet to learn how to select its leaders aright and to form a body of *elite*, to combine the merits of aristocracy and democracy. Such a body of *elite* is not to be constituted, as under other systems, by a group of self-styled supermen. Rather it is to be made up of the leaders of voluntary associations working together to solve the problems of democratic government. Democracy has also to secure the right inter-relation, co-operation and organization of political parties, to prevent the too great predominance of any particular interest or party and of party organization. Democracy has also to learn how to deal with the problem of minorities. Too often and in too many countries have majorities discarded the method of co-operation in our own age and have tampered and interfered with the spiritual, educational, and political rights of minorities. The world has a great deal to learn in these respects as well as in the way of forming a system of education suited to Democracy. Above all, Democracy has to learn how to master national sovereignty and has to acquire the art of giving up some of the extreme features and aspects of national sovereignty in the interests of international co-operation. For, in a word, Democracy has to be international and as wide as the world if it is to be permanent. That is the greatest problem of our day; and, if it is not solved, our Democracy will share the fate of that Greek democracy which bloomed two thousand years ago.

Grounds for hope and optimism.

Having enumerated so far the requisites of a new world order we might pause to see whether there are any signs of the times which are favourable to the formation of such an order in the near future. It is well that, by general admission, a European federation—perhaps even the federation of the World—stands in the forefront of our war aims. That is certainly a great prospect at once of an economic and political character. But an ounce of fact is better than a pound of theorising and we would fain know of any change of heart in nations and among their leading statesmen in this direction. Fortunately, the dire necessity to which nations have been reduced by this great war has proved an excellent instructor, and the tide seems to have at long last turned decisively in the direction of international co-operation at once political and economic. Thus it was a magnificent gesture on the part of Mr. Churchill when he proposed in June last, a permanent union between the British Empire and the French Republic and a pooling of their political and economic powers. That gesture has been followed by another and a more fortunate one—the sharing of naval and aerial bases, both in the Atlantic and the Pacific Oceans—between Great Britain and the United States. Add to these the gifts of destroyers by America and arrangements for common defence between that great country and Canada (or rather Great Britain). These policies constitute great lessons in the art of international co-operation between Democratic countries as well as in that of mastering international sovereignty. Compared to co-operation in these matters that on the economic side is far easier; and already both Mr. Roosevelt and Mr. Wendell Wilkie have strongly advocated the policy of “generous aid to the limit of prudence and effectiveness to Great Britain” and have deplored “the loneliness of the United States which was the result of the foreign policies of the last eight years.” Here then, we are witnessing the formation of a great nucleus of the future great federation. As each conquered nation of Europe is liberated by the joint efforts thus contemplated, it will automatically join the new federation. Each such country will then be also in the right mood to join in the common economic and political policy of the federation and also to part with some of its national sovereignty. It is very probable that it is on these lines that we shall see the rise of a great world federation and the solution of the age-long problem of international co-operation in its political and economic aspects. We shall then learn to give a new meaning to the poet’s dictum.

“Thus on the flaming forge of life
Our fortunes must be wrought.”

WORLD ECONOMY OF THE FUTURE

By

PROF. V. G. KALE

Poona.

The present war has demonstrated the powerful influence which is exerted by the political, racial or social ideals of peoples on internal and external relations of nations in the economic sphere. During recent years the national or international equilibrium in trade and industry, in fact, in the daily lives of peoples, has been utterly destroyed. In certain countries, citizens have been deprived of their birth-right of individual freedom and they are dragooned by political cliques. Thus the very foundations of normal economic life have been dug up there and attempts are being made to create an altogether new national and world order. The substitution of autocracy and autarchy for popular liberty and freedom of competition, is intelligible as being inevitable and essential in times of war. What is however, peculiar to the present war is that years before its outbreak, what economists are wont to characterise as abnormal, had been systematically made the normal mode of life in internal and external relations by powerful nations on the European continent. Policies of States were dominated by ideals which were incapable of realisation by methods compatible with sound economical practice and reasoning. The period of war and a few years of the after-war period are usually regarded by economists as abnormal. But in the present instance, Russia, Germany, Italy and to a certain extent, Japan, had made the pre-war years as abnormal as the war period. All economic activities were regulated and controlled with a view to the attainment of a certain goal set before the people by their rulers. Economic considerations were subordinated to social, racial and political ideals, and individual freedom which within reasonable limits is essential for the smooth and beneficent working of economic life, was denied. Hobson's choice given to the people of Germany by their masters, between butter and guns is typical of this extraordinary state of affairs. The dictators have thus vastly improved on the ideals and methods of Mercantalists of the past.

Today's dictators of Europe have destroyed the freedom of the neighbouring nations by force and have sought to impose on them

their political yoke and economic slavery. They aspire to establish peace in Europe on the basis of this domination which they call "a new world order" and have threatened to confer the blessings of the latter on Africa and the near East. Japan has joined them and has declared its ambition to achieve in Asia what the European dictators have been doing in the West. What is the new "world order" which the Axis powers propose to establish for the good of mankind? Under that order, it seems to be presumed, the "superior" world states will deal with other and inferior nations as vassals. The latter will be defended by the leading States and their trade and industries will be regulated and controlled in the supposed interest of all. Peace will then reign in the whole world and under the protection and guardianship of the dominating powers the well-being of humanity will be safely and soundly promoted. The natural resources and the markets of the south will be controlled and distributed according to what the protecting angels regard as equitable and economic standards. If the actions and the declarations of dictators are any guide, such appears in substance, to be the conception of the world economy of the future formed by the ruling parties in Germany, Italy and perhaps also in Japan.

The very idea of such a world order resting upon brutal conquest and barbarous domination is repugnant to the mind and the spirit of every civilised person. The first task of all people who value individual liberty and national freedom lies, therefore, in preventing and destroying world domination that is now being attempted. A world economy that is expected to be beneficial to humanity, must be based on international co-operation and harmony. Individuals and States must be free to live their own lives without interference from outside and this freedom will be restricted only by common consent and general agreement. In a national economy effort is made to harmonise individual and common good. National good and the good of mankind have to be similarly reconciled by agreement. It is the failure to bring about such a harmony that has been responsible for internal conflicts within States and wars between nations. Mussolini's conception of aggressive war being an essential instrument of national progress and the Nazi theory of racial superiority are antagonistic to ordered, peaceful and happy human existence. Whatever excuses the dictators may put forward for their aggression and brutality, a world order can, not conceivably be based upon their principles.

World economy cannot be divorced from world politics. In fact, it is intimately bound up with international political relations.

With the march of modern material civilisation, nations have increasingly recognised the significance and the value of mutual understandings and common institutions as conducive to the general well-being of mankind. The post, the cable, sea transport, trade agreements, exchange of commodities, international banking are devices which have been employed to knit together the different constituents of world economy. In national economies the national States regulate these matters so far as regulation is necessary. In world economy, mutual agreement is the connecting link and common benefit is the motive. Thinkers of the liberal school believed that in the international as well as the national economic sphere, activities inspired by the individual economic motive and unhampered by State regulation, made for the well-being of all. This was a reaction against the Mercantilist system in which States dictated to their people the channels through which trade must pass and the manner in which agriculture and industries should be developed. It was believed that the abandonment of this policy and the adoption of *laissez faire*, would, by the removal of restrictions on individual initiative and freedom, lead to better exploitation of the national resources of the world, to an increase in the efficiency and productive capacity of labour and capital and to greater and more rapid progress of mankind. These results were, however, only partially achieved. With the extension of its territories and the expansion of its markets and sources of raw materials England did increase its productive capacity and wealth; and this growth of prosperity could be attributed to individual initiative, daring and organising power which made the most of improved machinery and every other means of making profit. British economy, however, suffered from lack of equilibrium within and other constituents of world economy soon began to feel that they had been left lagging behind in the race for economic prosperity. Germany, the U.S.A. and other countries thought that they had no use for a *laissez faire* policy which was wholly unsuited to their peculiar conditions and that Government patronage and regulation were essential for the development of their industries and trade. This new attitude was supported by a school of economists on a modified theory of international trade and of the relation of the State to the nation's economic life.

World economy consisted, before the last Great War, of national economies pursuing varied policies regarding economic development, differing in kind and degree as regards State intervention in matters affecting industry and trade. A working understanding existed between nations as to currency, exchange and commercial

policy in spite of protective tariffs and fiscal disputes. A kind of a balance of power and economic equilibrium supported world economy. The stability of the balance was, however, frequently threatened by the political ambition of certain nations and the discontent of others with their position in world economy. The Great War caused enormous destruction of life, property and wealth. National and international debts were piled high. While the productive capacity of certain industries increased, the power of consumption of peoples declined, channels of trade were changed and sources of raw materials and markets for finished goods were disturbed, currencies and exchanges were in confusion and a severe slump succeeded a boom. The wounds left on the body of world economy by the Great War took long to heal and in the course of the cure, the economy underwent a radical change.

In Europe, there was, after the War, great activity in the re-arrangement of national boundaries. New States were created and old ones were reconstructed. Old markets and sources of raw materials were split up and joined together without regard to economic consequences. Repayment of international debts created difficult problems and trade and international exchanges were thrown out of order. It took years for the world to settle down in this altered political and economic conditions and for a new world equilibrium to be established. Nations tried somehow or other to adjust themselves to the altered conditions. The League of Nations and the International Labour Office which had been set up to watch and guide the international system emerging from the peace, put forth continuous efforts to facilitate the change over and the establishment of stable political and economic relations. The preservation of the independence of small nations and of democracy was the basis of the new world order. But Germany was chafing under the new arrangements and nursing revenge and Russia soon broke away from them. The Nazi policy in Germany decided to upset the world order which emerged from the peace treaty and began its preparations for attaining this object. It meant the reorganisation of Germany's national economy and a radical change in its external economic relations. Italy followed its neighbour's example. The ideal of economic self-sufficiency, adopted by these two nations and the systematic efforts made by them for its success could not but adversely affect the structure of world economy which had already to face the efforts of the political and economic revolution in Russia. The League of Nations proved unequal to the task of defending the world order which it had been created to safeguard. It

could not likewise bring about adjustments in that order which experience and general feeling had shown to be necessary. World economy became unbalanced owing to the defection of Germany, Italy and Japan whose policies of aggression became a serious disturbing factor.

This was the state of affairs when the present war began. Before the task of reconstruction can be thought of, the disturbers of world peace have, of course, to be first defeated and the kind of order they want to impose on the world has to be prevented. The terrible ravages of the war will have to be repaired and the work of reorganising world order and world economy will have to be taken in hand. This will be one of the most difficult of tasks for all peoples of good will to perform. The war effort itself will have given a new turn to trade and industries. Exigencies of war have already made it imperatively necessary to establish and to expand certain industries, the future of which will have to be safeguarded. India's resources in raw materials and man power are being developed so that they may effectively contribute to common victory. Germany has already been manipulating the resources of conquered and occupied countries to its own advantage. It is certain that the people of these territories are longing for the restoration of economic as well as political freedom and this will have to be guaranteed to them. The British Commonwealth of nations and the U.S.A. will have to take the lead in constituting a sort of a world-federation of which free nations will be members and whose mutual economic relations will be inspired by common interest and regulated by common consent. It will be a tremendously difficult job to distribute productive power, industries and trade among the members of a world federation so as to give equal opportunities to all and to promote the well-being of every nation and race. If all the enormous losses, hardships and misery which the present war will have entailed, will not reconcile peoples of the earth to the idea of a world federation, all hope for the future of humanity must be abandoned. A world state may be a *Utopia* but a world economy reconstructed on the principles of equality and justice for all, will have to be accepted as a sheer necessity. Nations of the East as well as of the West will have a vital part to play in this world organisation and there is no reason why it should not succeed. There is at least no reason why an honest and earnest effort should not be made in that direction. The weak points in the organisation of the League of Nations are now patent and we can learn a great deal from the experience of its working.

It will be futile to try to work out the future world economy in any detail. It is sufficient to realise what its general lines and underlying principles will be. The experience of the period between the peace treaty at the close of the Great War and the outbreak of the present war will be a useful guide. It will have to be reinforced with our knowledge of the economic developments that will have taken place in the course of the present struggle. Account will also have to be taken of the recent happenings in Africa and Asia, the needs and aspirations of the nations and peoples of these continents, and in the light of these, of the basic requirements of the future world economy.



INTERNATIONAL MONETARY RELATIONS

By

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Economic or technological changes are forcing mankind in the direction of world-wide integration and interdependence but political tendencies strongly resist that trend. Technology makes for easier, larger and more rapid movement of goods, capital, labour and ideas across frontiers but politics constantly erects walls that restrict all these movements. Peoples of the world work at cross purposes and political nationalism refuses to adjust itself to the internationalism created by scientific advance and technical devices. A conflict rages between world economics and political units and there will be no stability till these forces have been accommodated to each other. After nearly a century of astounding discoveries and inventions which have multiplied the power of producing wealth almost at the will of man we still find ourselves in the same plight as the one described by Friedrich List, the difference being that what was then true of Germany is now true of the whole world. He says, "Thirty-eight customs boundaries in Germany cripple commerce as if each limb of a man's body were bound so that the blood could not flow over into another. To trade from Hamburg to Austria or from Berlin to Switzerland you must go through ten states and pay ten transit duties." In those days nationalism was a movement towards unity but to-day it has become in large part a movement for disunity and a clog in the progress of technology and economics which have by far transcended national limits. Political nationalism has Balkanized the whole world while economic technology has made of it a unified whole.

The tendency of technology is to expand the volume of international trade transactions while the tendency of politics is to contract that volume and live within the narrow confines of a nation. Barriers to economic intercourse constitute a major cause of wars, for they diminish economic opportunity of enterprising nations and give rise to fighting slogans such as "population pressure, access to raw materials, spheres of influence, and economic

imperialism." The first condition of political peace as well as economic welfare is to lessen the economic significance of political boundaries.

The structure of economy in future will be characterized by a mixed system, namely the principle of free enterprise, and the principle of conscious control will function side by side. The mixture of these two principles will be different in different countries and it will range all the way from liberal to planned economies. It is a problem of the first magnitude to work out methods for mutually beneficent relations between economic systems of divergent types and to switch on national politics from power economy to welfare economy.

We are at present concerned only with one aspect of international co-operation, namely how to secure monetary stability, how to counteract the business cycle, how to create the conditions under which a steady economic expansion can take place, and how to reconcile internal stability of the domestic prices with the external stability of one country's currency in terms of foreign currencies.

We have to determine the respective roles of *laissez-faire* and planning in the sphere of international monetary relations. As in other spheres we have to decide what should be left to the working of the automatic market forces and what should be subjected to conscious public control.

The primary task of the monetary system is to aid in the exchange of goods. The smooth functioning of the currency and credit system is an indispensable condition of international trading. On the behaviour of the money mechanism depends so much of those inflations and deflations, booms and depressions which make peaceful adjustments well nigh impossible.

We must first of all clear the deck for action and jettison a great many die-hard notions. The first is the tradition of an automatic self-regulating gold standard which under modern conditions has lost nearly all its merits. The idea of money linked to gold may be given up and we may move on to the position where the total amount of money supply and the ratio of one national currency unit to another are matters of conscious management. In the second place we need a psychic revolution whereby panics which are easy to start and hard to stop could be eliminated. The international movement of funds should be in response to trade require-

ments and not as a result of fear. In place of "hot money" and "floating balances" there should be healthy foreign lending. In the third place various instruments of monetary management have been devised or discovered such as manipulation of the bank rate, open market operations, devaluation, sterilization of unwanted gold funds, changes in the reserve ratios of banks, exchange equalization funds and public works policy but these are operated by national governments each in its own interest and frequently at cross purposes with others. These instruments should be wielded by an international body or by an association of national banking systems. Some experiments in monetary internationalism have been made already e.g. the sterling bloc, the tripartite agreement between Great Britain, France and U.S.A. and the Bank for International Settlement. Concerted action along these lines should be further developed.

It is not possible for any country to insulate itself against world currents. No country acting alone can secure full employment of its productive resources. The world economic depression of the nineteen thirties was met by each country following its own policy of beggar-my-neighbour with the result that the crisis deepened and assumed disastrous proportions. Economic wisdom lay in the direction of co-operative efforts to arrest the downward sweep of deflation. Monetary nationalism has been the bane of a stricken and divided world and in place of international agreement for the good of all we have had competitive depreciation, mounting trade barriers, exchange controls and autarchy. We do not wish to convey that monetary policy alone can keep our economic system in smooth running order but that it will go a long way in achieving world stability and ordered development.

The world having become a single economic unit we have to move more and more towards international control and inter-regional co-operation. In the monetary sphere we must devise an International Authority which will undertake the responsibility of regulating monetary relations between the Member States. The obvious suggestion is that they should adopt a common international currency.

An international currency may take various forms.

(1) A number of countries may agree to adopt a gold standard and the same monetary unit of account. They will co-operate in minting coins of the same gold value and with the same name as distinguished from the orthodox gold standard which operates

through the free coinage of gold into national coins such as the gold sovereign or the gold dollar. In no fundamental respect will the international currency differ from the old system based on the free minting of national coins except the convenience of having the same monetary unit of account for all countries under consideration.

A further development of the same system in consonance with modern banking practice would be that each Central Bank would issue notes of the same designation and the same gold value. The countries would be using the same monetary unit and the Central Bank of each country would be under the legal obligation to buy and sell gold at a fixed price in terms of its note issue.

(2) A number of countries might agree to set up an international Bank charged with the sole right of note issue. These notes will form the only legal tender currency and they may or may not be backed by a reserve of gold. In each country there will be a Central Bank fulfilling all the functions of a central institution except the right of issuing notes. For example the Central Bank will have the power of raising or lowering the money rate at which it is willing to grant credits and also the power of expanding or contracting the quantity of deposit money through open-market operations. The credit supply put out by the Central Bank will be regulated by the necessity to keep a sufficient reserve of the notes—the international Bank notes to meet the demands made by commercial banks for these notes.

The principal merit of this system is that the total monetary supplies of the countries in question will depend not upon the accidental circumstances of gold mining and the demand for gold for monetary as well as non-monetary purposes but upon the trade demand for the circulating media. The international currency is well adapted as an instrument for adjusting the balance of payments among the Member States. If, for example, one particular country shows an excess of imports over exports, the excess will be paid off by a shipment of notes. In consequence there will be a reduction in the supply of money which will cause a fall in incomes, prices and costs and conversely a rise in the countries receiving the exported currency notes. These movements will check the initial excess of imports on the one side and the excess of exports on the other till equilibrium is restored and the surplus of payments over receipts in the trade balance disappears. For a time the Central Bank may offset the loss of its note reserves by ex-

panding the internal supply of deposit money but sooner or later the continued export of monetary reserves will threaten the stability of the Central Bank and it will be obliged to restrict credit and deflate incomes and prices and thus ensure the convertibility of its deposits into the international currency.

Yet another advantage over the system of independent national currencies is that the rate of exchange is a fixed known quantity. There is no fear of frequent fluctuations and international trade will be relieved of the haunting fear of unstable exchanges and the flight of capital from a currency which is expected to depreciate to one which is reckoned to be sound thus causing disturbance to both.

Will an international system based upon, let us assume, free trade and a common currency remove the menace of trade depression? The answer is that these two criteria alone will not immunize our system against periodic booms and depressions, for during the nineteenth century trade fluctuations occurred despite an international gold standard and fairly liberal conditions in world trade. In order to exercise adequate control over trade conditions and prevent industrial fluctuations the International Currency Authority must have the ultimate power of regulating the total supply of money within the Member States. Whenever a trade depression tends to develop itself it could expand the issue of notes and increase the monetary reserves of the various national banking systems. It could thus correct the manifestations of the oncoming depression e.g. reduction in prices, costs, incomes and money expenditures. Conversely at the onset of a boom it could restrict the total supply of money and thus hold in check an inflationary movement showing itself in a rise of prices and incomes.

It is however doubtful how far the control over supplies of currency can be made effective. For one thing the Central Banks while receiving the additional supplies might take steps to sterilize the new currency and prevent it from fulfilling its function of monetary expansion. Secondly, even if the International Bank could exercise effective control over the total money supplies in the Member States there is the additional difficulty to be encountered, namely that business enterprise might be unwilling to use the additional funds. These funds are intended to arrest the downward movement of profits and prices and if private enterprise will not react to cheap money and plentiful money the depression will have its own way. In such a circumstance each state under the direction of the International Authority should make use of the idle funds for public works until private enterprise once again gets a move on.

In a dynamic world there is constant need of machinery for re-adjusting a disequilibrium in the balance of international payments. Apart from a general trade depression, the disequilibrium may be caused by several forces such for example as that country A producing rice for export and country B producing wheat for export may discover a marked tendency for the substitution of wheat for rice. Country A will be faced with an excess of payments over receipts, causing it to lose monetary reserves and Country B will be in a contrary situation. To correct the excess in each case the proper remedy would be, leaving aside the device of import restrictions, a monetary deflation of incomes, prices and costs in A or a monetary inflation in B. Deflation of prices will lead to a reduction of profit margins and so to unemployment but the extent of the damage and the quickness of the recovery will depend upon the flexibility of costs such as wage rates moving downwards with the falling prices. The efficient working of the International Currency system depends upon the resilience of the costs in the Member States. But national planning of prices and costs produce considerable rigidities which prevent an easy adjustment to new conditions. For example the railway fares, the rates for gas, electricity and water, the school fees, rents, insurance premiums, and the prices fixed by industrial cartels and agricultural control schemes are all in the nature of long-term contracts and a general deflation of money incomes and money expenditures would lead to a considerable decline of production and employment while prices and costs would painfully and sluggishly adjust themselves to the deflated level. If the fundamental condition of flexibility is not satisfied—in the planned systems rigidity is a marked feature—then the necessary readjustment between the countries must be made by variations in the rate of exchange.

Free trade or freer trade will assist the process of reestablishing equilibrium. It is easy to stimulate exports as a corrective of a country's trade position in the absence of tariffs and various restrictive measures. Free trade will reduce the extent of the period of deflation as the exports will be stimulated under the two-fold impulse of no restrictions and lowered prices. Hence a general lowering of trade restrictions will greatly aid the successful working of the international currency.

WORLD ECONOMY AFTER THE WAR

By

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I

For well nigh three quarters of a century before the last Great War the Western World had developed something like an international economic order in which the main ingredients were relative freedom of trade, of capital and of labour. That economy was based internally upon what may broadly be termed as capitalism, in which the mainspring of all industrial and agricultural life was the motive of profit, subject to a limited sphere of economic activity on the part of the State. In its external aspect it may be described as economic liberalism in which people believed in the efficacy of international specialisation of functions and exchange and in raising their material welfare by freedom of trade and commerce. Such an economy was greatly strengthened by a world monetary system which, originally based upon bimetallism and later upon gold, functioned smoothly. The international gold standard brought about a fundamental unity in the price and income structure in the various countries which had adopted it, for with fixed exchanges between the currencies of various countries, it not only ensured a smooth flow of goods and facilitated free and safe movements of capital but also unified the industrial structure of countries all of which were more or less similarly affected by the same set of monetary and economic factors.

Such a system did work fairly satisfactorily for a considerable time. What is even more important, nations came to believe that on the whole it was the best system conceivable and that it stood for great and rapid economic progress. It was the logical culmination of the operation of those germinal ideas of freedom of competition, self-interest and *laissez faire*, which exerted such a strong and powerful influence in the 19th century.

Not that these forces of competition and *laissez faire* operated at any time undisturbed. Freedom of competition was found, in practice, to be greatly limited by the serious inroad of monopoly into economic life. Combinations and other associations of industrial units greatly modified the pristine purity of free competition.

Nor was the State that passive instrument which the *laissez faire* doctrinaires would make of it. Governments began to control certain spheres of economic activity and to interfere in other directions. Further certain rigidities partly brought about by the State and partly by the action of organisations of workers had crept into the system which increasingly damaged the resilience of the economic system and its adaptability. So that the world of free competition and economic liberalism was not the world contemplated by Adam Smith and Mill, nor was the role of government that assigned to it by Bentham.

But despite all the above modifications, the picture of the Western World as a unified economic unit broadly remained true. The achievements of such an economy were, if not spectacular, undoubtedly great. It saw a vast and rapid increase in national wealth. It brought about a great increase in population. New regions were conquered and resources exploited. The growing population of the world was fed on an increasing scale of living, never before equalled in the history of mankind.

Unfortunately, however, this bright picture of world economy had its own dark patch. Side by side with the division of the world into national states, capitalism brought about a new division, the world of the rich and the world of the poor—the haves and the have-nots. The grave inequality in the incomes of the people within each country, whether it may be justified or not and whether it should be regarded as an inevitable and necessary accompaniment of capitalism or only an incident which may be done with, remained a festering sore. Secondly, its claim that however defective it may have been in the sphere of distribution, it always ensured a continuous increase in the stream of production could not be sustained in the face of the ever-recurrent crises and depressions which it could do nothing to avert. Millions of people are thrown into the dust-heap for no fault of theirs, and an economy which can function only on the basis of these periodical hold-ups and breakdowns cannot be considered to be even reasonably efficient. But even more important than the above is the fact that the trade cycle has broken up the economic unity of the world, which constituted its main claim to merit. The economic world has now been cut up into bits. There is no international monetary system based upon a common monetary standard. Prices and incomes do not move and are not allowed to move in unison. Trade and commerce are no longer free. Each country is seeking to raise a mountain-high level of tariffs and to impose other forms

of barrier to the free movements of goods. Capital no longer seeks the regions of profitable investment; and refugee funds move from one centre to another in desperate search of the will-o'-the wisp of security. The free flow of labour from one country to another, i.e., migration, has been also arrested, thanks to the policies pursued by the U.S.A., Australia and other countries. To-day there is no world economic order, even if one confines his attention to the Western world.

Again, as Dr. Thomas has rightly pointed out, in all this material and industrial advance, the East has had to play the role of a Cinderella. Colonies have been exploited, not in the interests of the peoples living therein, but to the benefit of the Western nations. Such an unjust order of things contains within itself the roots of destruction.

Finally, the world economic order despite all its conscious and unconscious efforts was unable to check the aggressiveness and cupidity of capitalists in their exploitation of resources and search for markets. Wars have been brought about partly by economic factors, and some wars at least have been the result of predatory capitalism. In their anxiety to make profits, however dubious the methods may be, capitalists have not infrequently thrown in the full weight of their economic power for development of the armament industry—thus directly promoting the chances of war.

II

The world can no longer afford to have two such wars on a major scale within the short span of 25 years. Between these wars and the trade cycles, the old kind of capitalism is doomed. There is no chance of capitalism emerging unscathed after this war. It has played itself out. The instruments of control which the war has evolved are not likely to be thrown into the scrap-heap, but will remain as more or less permanent methods of control. What should be the nature of the economic order within each country after the war, and what should be or would be the nature of an international order are questions the answers to which are bound to be extremely uncertain. Much will depend upon the ideas that now dominate the peoples of the world and at the time when peace terms are settled.

Within each country the nature of the internal economic system that will emerge after this Armageddon will depend upon the respective ideologies prevalent in different countries. It is,

however, safe to state that no single uniform pattern of economic organisation will be adopted by all countries and that differences in economic structure and organisation are inevitable. There are, of course, various possibilities. In the first place, there is the possibility of an extension in the sphere of state ownership and management of enterprise, not as a mere compromise between capitalism and socialism, but as a deliberate and conscious effort to get the best out of both private enterprise and initiative on the one hand and of public management on the other. In the happy language of Sir A. Salter, the new organisation should be based on "selective compromise," and seek to retain the best features of both.

The second type of development is the extension of the sphere of co-operative organisation. The British Consumers' Movement has developed vast trading activities and eliminated the profiteer. But the forces of capitalism have combined with certain classes of producers to arrest its onward march. Consumers' organisations have now to fight not merely the monopolist manufacturers, the cartels and combines, but also agricultural marketing boards. Surely in view of the superior moral foundation of the co-operatives, a new attitude to their growth and development is called for. The co-operative movement is directed towards organising industry on the basis of mutuality—All for Each and Each for All—and there can be no conflict of interests between the producer and the consumer, because the gains of production accrue to the consumer. Great Britain, Sweden, Finland are countries where productive organisation directed by and in the interest of the consumers has reached a high stage of development. In other countries like Holland, Denmark, Belgium, Switzerland, etc., agricultural co-operation has done no less service to the ryots; and the bulk of production and marketing is in the hands of co-operatives which have ensured a fair deal to all. In the future organisation of industry and agriculture therefore co-operation may be expected to play a large part. It should supplant private capitalism, and should function alongside of national, local and other semi-public organisations controlling spheres of economic activity which cannot readily come within the range of co-operative activity. In any case the whole economic life of a country must be permeated by the co-operative spirit. No industry should be allowed to carry on unless its profits go to the community as a whole and are prevented from enriching the pockets of particular sections of the community.

But these by no means exhaust the possible lines of development. There is the totalitarian form of economic organisation which has taken in recent years two forms, the Fascist and the Nazi forms and the Soviet-socialism of Russia. There are those who find nothing to choose between these two. But it seems to the present writer a clear mistake not to be able to distinguish between the two. With all its shortcomings, the communism of Russia has been inspired by the desire to eliminate poverty and to ensure economic equality. Nazism and Fascism despite all their achievements stand for the overthrow of democracy and for the over-glorification of the State as against the people. The people's welfare is but an incident in the march of the car of Juggernaut.

But what is going to happen in the future after this war ends? Can we be sure that the organization of the Italian and German variety will disappear and that of the Russian type be considerably modified so as to ensure greater freedom to the common man? We cannot tell. But it is open to us to suggest that socialism of a more democratic type than has been evolved so far is not only practicable but is likely to be established in some countries. The reasons for this view are several. Only one or two need be put down here. We have not yet discovered a way to do away with vast accumulation of wealth in the hands of individuals by the pedestrian methods of income and death duties. Indeed, the distribution of wealth and income has been more, and not less uneven after these taxes have been imposed than before. Secondly, the elimination of the problem of unemployment and the combating of the slump can only be achieved by a more direct action on the part of the States. Hence it may be expected that some countries at least will embark upon socialism in which all the instruments of production will be entirely owned and controlled by the State and that no one will be allowed to work for an employer other than the State.

III

We shall thus have different types of economic organisation functioning at different levels. But if we are not to revert to barbarism, but restore civilization back to humanity, we cannot afford to give free rein to the forces of selfish nationalism and aggrandisement which have marked the activities of a number of States in recent times. National differences of organisation may be permitted up to a point; but these differences should stop short of exploiting or injuring the peoples of other countries. From this point of view it is doubtful whether there can be any hope for the

world if the ideas that now permeate the States in Germany and in Italy are allowed to exert any influence after the war. There are some who hold that a world order can be built out of very divergent and conflicting economic ideologies. Mr. Meade for instance in his very interesting book entitled *The Economic Basis of a Durable Peace* pleads for a place in his proposed new international organisation for all kinds of rival economic systems. But surely there can be little common ground between Nazi economic system and an international economic system, for each is based on entirely different and opposite economic principles. We should therefore draw the line at the Nazi or Fascist economic systems, unless they are prepared to shed their militant and aggressive nationalist spirit and willing to co-operate in the evolution of a new economic order.

The New Economic Order must be based upon a frank acceptance of a new scale of values in which no group can be allowed to march by pushing back other groups. The welfare of any nation cannot be at the expense of that of other nations. This needs particular stress because too often in the past the economic progress of certain Western countries has been at the expense of the less advanced countries.

On the basis of this new principle of co-operation, a new world order may be built up. It should, however, have a certain institutional framework. An international economic organisation should be set up, open to all countries prepared to accept these leading principles, and all those States which are willing to join should agree definitely to surrender certain economic questions for decision and administration by a duly constituted International Authority. Once again we must bring about a unified currency and monetary system. The International Monetary Authority should have the ultimate power of controlling both the total supply of money and of expenditure within the member States; because only then can an active anti-slump policy be adopted. It is not necessary to have the same currency adopted everywhere, although it would be simpler and smoother if all countries have the same monetary unit.

The objective of the International Authority should be to ensure freedom of trade as far as possible, although the right of member countries to control their foreign trade may be conceded, provided certain definite and previously agreed principles of action are adhered to. Freedom of movement of capital should be allowed, although in the case of countries which are socialistic

and where all savings are in the hands of the government, the guiding principle that surplus capital is freely allowed to be lent abroad is difficult of enforcement. In regard to the development of unexploited regions, the policy of open door may be laid down subject always to the over-riding consideration that the resources should be exploited to the benefit of the people living therein. Above all it is necessary that the right of free movement of labour from one country to another should be secured. There may be reasonable conditions imposed in regard to migration, but the dog-in-the-manger policy now adopted by various nations should not be allowed.

A new world order based on free entry to all nations of the West and the East, the advanced and the less advanced, is the only way by which civilization may yet be salvaged. There are, of course, difficulties ahead. Nor is it necessary that all should enter as members of the new organization. Provided the door is kept open, and the policy pursued by this organization is convincingly shown to be in the interests of all, it is bound to be both successful and productive of great good.



ECONOMIC FACTORS IN AGRICULTURAL DEVELOPMENT*

By

K. C. RAMAKRISHNAN

I. *Economic Aims. Handicaps and Incentives.*

The ultimate aim of all agricultural development should be to ensure as high an income as possible for every worker on land, and not merely raise the yield per acre or secure a larger return on the capital invested. Comparisons are commonly made in agricultural publications of acreage yields of particular crops in different countries without reference to the diverse conditions, social as well as physical, in which they are produced. For instance, it is not so well known that in China, which is quoted for high yield per acre of rice and wheat, that the peasant had to sweat more than in any other country on his tiny holding, especially because of the lack of cattle power ; and for manure he has to depend largely on night-soil. In Japan, again, which has next to Italy the highest yield of rice per acre, the tenant cultivator has not only to put in very hard work but he remains for ever in debt on account of the forced use of fertilisers at the behest of his money-lending landlord, and is often obliged to pay off the interest due by sending his children to toil in the small industries run by the same landlord. It is no doubt necessary in old settled countries, where scope for expansion of cultivation is limited and population is already pressing on the soil, that all efforts should be made to raise the yield per acre, if only as a means to raise it per worker. But it is necessary to reckon, in addition to items paid for in cash or kind, the human cost involved in such production. It is not altogether a matter for satisfaction that the Indian ryot "will struggle on patiently and uncomplainingly in the face of difficulties in a way that no one else could".

The fundamental handicap to the development of Indian agriculture is the smallness of most of the holdings, to which a parallel cannot be found in any western agricultural country. China and Japan alone have tinier farms. Hard work and ample manuring account for phenomenally high yields per acre in these two countries. In the newer lands of America and Australia where cultiva-

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vation is extensive the yield per acre is low, but not the yield per worker. In Western Europe, where holdings are smaller than in America but bigger than in Asia, the yield per worker as well as per acre is high because of intensive cultivation and the efficiency of the farmer. It is only in India that the yield per acre as well as per man is low. Holdings are uneconomic and farmers are inefficient according to modern standards. Our holdings need to be enlarged as well as consolidated to become economic. It is a sign of the low standard that prevails in India that the common conception of an 'economic holding' is different from that which prevails elsewhere. A holding that provides subsistence for the farmer's family is called economic here, while among economists in the West an economic holding generally implies a holding that can fully engage the productive powers of the farmer and his family with the best available equipment. But whatever be the standard adopted, the optimum size of holding would vary with a number of factors: the nature of the crops, the conditions of soil, climate and water-supply, the capacity of cattle, the kind of equipment and the efficiency of the farmer; so that it is not easy to lay down a particular size under all conditions. Granting that the lower, subsistence standard is adopted and sizes are prescribed with reference to particular circumstances, it will not be easy in several provinces to secure even the minimum for the agriculturists who need it, unless perhaps the so-called 'cultivable' lands are all reclaimed. We have little precise data on the nature of these cultivable wastes, of the physical and economic difficulties in reclaiming them. Opinions are on the whole more pessimistic than optimistic. In a country with so much need for further land settlements, it is imperative that the State should set up an expert body to investigate and suggest ways and means of utilising these wastes and allotting them to farmers who show enough evidence of capacity to cultivate them, reserving for the State the power to resume them in case of bad cultivation.

Another evil commonly associated with small holding, but not exclusively confined to it, is the fragmentation of lands of the same holder. A revenue holding in Madras has been called "a conglomeration of fields and sub-divisions in a single village." The big holder has his holding as fragmented as the small one and makes little attempt to consolidate it. Most of the fragments are leased out to different tenants, the holder himself at best retaining a few acres for cultivation by farm servants. A case for fragmentation is often made out on grounds of diversity of soils and variety of

water resources in one and the same village, which permit diversity of cropping and the spread of risks. But surely it would not be difficult to divide all the lands in a village into three or four blocks of arable land of different degrees of fertility or lying in different levels or irrigated by different systems. The re-allocation can be made in such a way that no holder need be refused any particular class of arable land of which he had owned a fragment, unless it was too small and it would be better to allot a compact holding of workable size in one block. No reformer desires to pool wet and dry and garden lands or pasture and wood lands. Every owner of plots in these lands is bound to carry on much better if he gets a compact field in each class of land. This is indeed the *sine qua non* of a number of agricultural improvements—of better animal husbandry in particular. In Europe the open field system with scattered strips of holdings—where, however, a medley of crops in different stages of growth was not permitted as is done on our wet lands—has been doomed for over a century now, though its extinction seems to be a slow and painful process in some countries. The consolidation of fragmented holdings has been brought about in many countries by means of legislation which permitted and aided a majority in an area to have all the holdings properly restripped and allotted, even if a small minority was obstructive. The Punjab has succeeded in consolidating, by the more difficult co-operative methods, about a million acres. The Central Provinces more recently resorted, like European countries, to coercive legislation. Though the law has been enforced in only one Division, the area consolidated exceeds that of the Punjab, which has since enacted similar legislation, though it continues also co-operative methods. Co-operative consolidation is being tried in Madras, but with feeble results so far. Only about 500 acres have been consolidated, all in one district.

Even if the reform is brought about by coercive legislation, it should be realised that consolidation once effected cannot be proof against further subdivision and fragmentation, unless the law and custom of inheritance are changed and other avenues of employment are found for the future generation—whose numbers are bound to grow more and more in excess of the requirements of land, judged by the trends in the growth of population on the one hand and the possible progress of agriculture on the other. In fact, in every country where agriculture has been held in high esteem, there is a striking shrinkage in the proportion of agricultural population to the total population in the last 50 or 60 years. For instance, the

fall in France was from 52 to 40 per cent, in Germany from 42 to 30 per cent, in Denmark from 50 to 30 per cent, and in the United States it has gone down in the last 40 years from 33 to 22 per cent. The same has happened in Scandinavia and Netherlands and in Canada and Australia.

There is a fear that consolidation may mean more rural unemployment on account of the scope it may offer for the use of labour-saving machinery. This is likely; but it only shows up the waste of labour that has been going on. It is also possible, on the other hand, that in a compact holding the scope for labour is widened by the digging of wells and lift irrigation or by the cultivation of more valuable crops demanding along with other things more labour per acre, e.g. sugarcane, plantains, Cambodia cotton, tobacco, fruit trees and vegetables and the production of milk—the demand for all of which is bound to grow with an increase in general prosperity.

In India with land so scarce, capital so shy and labour so abundant and cheap, the scope for the use of labour-saving machinery is limited in the vast majority of holdings, even if they be consolidated. There is a slowly growing demand for a few types of power machinery like the tractor plough, the oil engine or electric water lift, and the sugarcane crusher, which only the bigger landholders can afford to purchase. Even they do not want sowing or harvesting machinery. But the small holders can be encouraged to use less expensive labour-aiding or labour-improving implements like the mould-board iron plough, the seed-drill and the bullock-hoe, on dry soils in particular. It is also possible, if they co-operate, to buy or hire jointly and use in turns the costlier tractor-plough and the cane-crusher. There is little excuse, however, for even smaller farmers in scattered holdings failing to use the better seeds and adopt the methods of conservation of local manures recommended by the Department of Agriculture. The cost in either case is only a trifle higher, and it is the least expensive way of increasing the return from land.

India though old in the art of agriculture is still an infant in the adoption of scientific ways of production and improved methods of economic organisation. These are the means by which European peasants have been repeatedly able to defer the operation of the law of diminishing returns on land. Indian cultivators have still to try so many known improvements in the art (rather the science) of agriculture, that the law of diminishing returns, whose ultimate validity may not be questioned by us, need not be a bug-bear now.

An important negative cause of the slow response of the Indian ryot to the efforts made by the scientists and other agricultural reformers is the lack of stimulus in India comparable to the severe competition felt by peasants of Western European countries in the seventies of the last century from the import of cheap grains from the virgin soil of America. It is this that drove them into new and more efficient lines of agricultural production and co-operative organisation. It is only in the last ten years, that is since the Depression began, that India has come to feel the effect of the growing competition, in foreign and even in home markets, from the tropical possessions of European States which have been most of them developed in the twentieth century. Whether the Depression has, on the whole, depressed more than it stimulated the Indian agriculturist, it is too early to say. But there are not wanting signs of an increased interest on the part of enterprising ryots in certain districts in the improvement of agriculture on modern lines. Strange as it may seem, it is in the proximity of industrial and commercial centres that the greatest progress has been made in the technique and organisation of agriculture.

A more rapid industrial development of India is desirable not only from the point of view of self-sufficiency of the country and an all-round efficiency of the people but also for the relief it will afford to land which is overcrowded and subjected to morcellement by the increasing number of heirs. Not all new industries need be large or giant industries. Village industries might at first be adversely affected, but there would still be spheres in which small scale production would survive and supplement large scale manufactures, if aided by better tools and cheap electric power as in Japan. Not only the artisans, but agriculturists will stand to gain by the adoption of better tools and implements easily manufactured in industrial centres. More chemical manures (the by-product of heavy industries) and more organic manures (the refuse of populous cities) can be obtained for the benefit of agriculture. More capital, managerial ability and skilled labour are easier to procure in an industrial than in an essentially rural environment. Better business methods of credit, purchase, processing and sale are almost always available in urban areas and they can be slowly imbibed by rural folk in the neighbourhood. The market not only for the raw materials of industry but also for staple foodstuffs and agricultural specialities—in particular, fruits, vegetables, eggs, milk and ghee—is greater in a prosperous industrial community than in a predomi-

nantly agricultural society. But for the expansion of industries and the consequent widening of markets, there would have been little development of the dairy or any other intensive form of agriculture in Europe.

Let us not also forget that in Western countries like Germany, Italy and Ireland the impulse and inspiration for rural reconstruction came from leaders, who were not agriculturists but were products of urban civilisation, like Raiffeisen, Luzzatti and Horace Plunkett.

II. *Co-operative Organization of Agriculture.*

It is a melancholy fact that after 35 years of working of the reorganised Departments of Agriculture in India the land under improved varieties is only a fraction of the total area under the particular crops. For instance, of rice and groundnut, the improved strains do not cover more than 5 per cent of the area under each, while of cotton the proportion is 20 per cent. A very important cause of the feeble response made by the Indian ryots to the efforts of the Department is the lack of capital not only for permanent and substantial improvements but even for current cultivation expenses. In fact many of them have not the wherewithal to maintain their families some months after the harvest. The proceeds of the harvest are nearly exhausted in paying off the taxes and rates, in making part payments to creditors, and in buying long needed clothing and foodstuffs not grown on their own lands. All are not able to lay by enough grains and other food-stuffs grown on their very fields for the rest of the year. They sell them at a low price and later on purchase at a much higher price swelling thereby the profits of the merchants. A good harvest is a doubtful blessing as it only enables the money-lender to recover more of his dues.

Not even seeds are preserved for the next sowing by all. If they are, they are not carefully selected. There is either inadequate appreciation of the superior seeds evolved by the Department or inability to buy them. Inability to buy arises partly from lack of funds and partly from lack of such seeds near at hand. Any seeds stocked by merchants or money-lenders are purchased or borrowed at exorbitant rates. Ryots in some tracts have learnt to value superior strains like GEB 24 of paddy and Co₂ of Cambodia cotton. But no agency, steady and reliable, has been organised to multiply those varieties and distribute them at reasonable rates, as trained nursery-men do in western countries. This is a work eminently fit to be undertaken by the agricultural graduates who hanker in vain for salaried service. Seed farms should be organis-

ed on co-operative lines in much larger numbers all over the country. A few stray farms here and there are hardly adequate.

The value of manures, even of chemical manures like sulphate of ammonia, not to speak of concentrates like oil-cakes and bone-meal, is well understood in many wet land and garden land tracts; but ryots suffer from a lack of credit facilities at reasonable rates free from any taint of exploitation, and from the absence of an organisation of their own which will supply these manures free from adulteration and at an economic price. That is why even South India, which is said to be more 'fertiliser-minded,' consumes so little of these manures.

Implements like iron ploughs, seed-drills and bullock-hoes are slowly getting into favour, specially where speed and thoroughness of cultivation are essential, as in the sugarcane and cotton tracts. And yet the number of implements actually sold in South India is far below the number that agricultural and industrial enthusiasts, like Sir A. Chatterton, expected. There is an important physical limitation in our province which makes the problem economically more difficult of solution. We have a variety of soils and climates that call for a variety of implements in different tracts. This hinders standardisation of implements and their manufacture on a large scale, which alone can reduce the costs of production and marketing and facilitate the supply of spare parts.

For over sixty years in Europe co-operative organisation has been considered to be the only means of salvation for petty peasants, as without it the economies realised by larger farms in securing credit, purchasing agricultural requirements, processing and selling produce could not be realised by the smaller farms—though in farming technique the small holders could at least hold their own with the bigger ones in certain lines of farming, e.g. dairy and poultry farming and the cultivation of fruits and vegetables. The supply of improved agricultural requirements was among the earliest type of co-operative services organised in Western Europe. One of the ways to meet the growing competition from the New World was to intensify cultivation by the use of better seeds, manures and implements. The supply of these at reasonable rates and free from fraud was best done by co-operative societies of producers. Another way to meet American competition was to transform the system of agriculture into one of animal husbandry, the disposal of whose products in distant markets was very much facilitated by co-operative processing and marketing. In Ger-

many though Raiffeisen began his experiments with credit societies, he urged them to undertake the supply of agricultural and domestic requisites, the processing and selling of members' produce and to promote the moral as well as material interest of members.

In India the Raiffeisen credit societies had dominated the field of co-operation for over 25 years and eclipsed all other forms of co-operative activity until recently. Yet not more than 25 per cent of the villages have been at all touched by co-operative credit. Even where the Raiffeisen system has spread, for all appearances, the working of the system has revealed a number of grave defects which are the subjects of enquiry by a committee. Over-dues have mounted up with no prospect of clearance in the near future. At least 25 per cent of the old societies will have to be liquidated at once. A new type of society may be tried in these and other villages.

A fatal flaw in the adaptation of the Raiffeisen credit system in India was that loans might be granted for unproductive, if necessary, as well as productive purposes. The rule was liberally interpreted and even ostensibly productive loans were utilised for the clearance of pressing prior debts, which could seldom be repaid within the stipulated period. It took more than a quarter of a century for those in charge of the movement to realise the need for a separate land mortgage banking system to finance long-term credit needs. Here again it is a matter for regret that our land mortgage banks have been so far doling out loans to clear off the prior debts of members, incurred generally for unproductive purposes, rather than helping them to effect permanent improvements on land or equip the farms with durable machinery. Provision has been recently made for loans for the sinking of wells, the installation of oil engines or electric plant for lifting water or crushing sugar-cane etc., but as yet little has been done. The demand for such loans does not easily come from the ryot. It is for the banks to take the initiative and educate the cultivator in the better use of long-term credit facilities. The Government has been for over 55 years offering what are known as Taqavi loans for permanent improvements; but for a variety of reasons, such loans are hardly popular with the ryots. Taqavi loans have also been granted for short term cultivation expenses, but not in normal years generally. The recent practice in Madras of entrusting the grant of such loans to the officers of the Agricultural instead of the Revenue Department is a welcome change.

Agricultural improvements have seldom constituted the real purpose of a co-operative loan, either short-term or long-term. So, whatever may be the technical success of some of our co-operative credit institutions from the purely financial point of view, it cannot be said that the earning capacity of our agriculturists has been increased.

In India rural credit societies, modelled as they were on Raiffeisen's, had among the objects provision for the supply of the agricultural and domestic requirements of members, the purchase and hire of machinery for the use of members, the sale of members' produce and the dissemination of the knowledge of the latest improvements in agriculture and handicrafts. This imposing array of aims was seldom taken up seriously, and there were not even a hundred out of 11,000 rural credit societies in the Madras Presidency that supplied or encouraged the use of improved agricultural implements, manure and seeds. The *ad hoc* supply societies were small and spasmodic in functioning. The Loan and Sale societies, of which there were more than a hundred, did supply some improved seeds and manures. There were also a few Agricultural Improvement Societies that had supply as one of their functions and did business to the tune of Rs. 1.4 lakhs for the whole Presidency for a year. Other Provinces did not have a more creditable record in promoting agricultural improvements and supplying the requirements of modern agriculture. This is in striking contrast to the work done by co-operative societies in Western European countries and Japan. The Agricultural syndicates of France and the societies of peasants in Belgium, guided by the Catholic clergy, have done more to improve agriculture than departments of State. In Japan, though co-operative societies were not pioneers of new agriculture, 80 per cent of the 15,000 agricultural societies supplied seeds, fertilisers, implements, etc. to the tune of 70 million yen or Rs. 5 crores per annum—for a country with but 18 million acres of cultivated land.

Whether it is wise to separate supply from credit societies in view of the scare the enforcement of unlimited liability has created in the minds of well-to-do ryots or to stick to multi-purpose societies in view of the lack of human material to manage a variety of societies might be a moot point in India. But, whether alone or in combination, the supply of agricultural requirements was among the most important activities of co-operative societies in Europe and abroad. So powerful have some of the societies grown that in a number of countries they have through their wholesales taken up

the manufacture of implements and manures and even the multiplication of seeds for distribution to members.

Marketing of agricultural produce in a raw condition was the most difficult and the latest of co-operative ventures to succeed in Europe. As long as produce was neither uniform nor graded and it met a local want, it was difficult to make a success of co-operative sale. Producers of better quality would not accept the same price as for inferior crops and it was difficult to pool produce of different members. The Society could not negotiate for a better price with uneven qualities and it was often left with unsaleable surpluses of members' produce. Production did not improve until a free and sure flow of surplus produce to the world's market was secured for the farmers. But the outside world would not care for produce that was not improved. This vicious circle was broken by leaders who organised at the same time co-operative sale and agricultural improvement.

Of all attempts at co-operative sale that have so far been made in India, the most successful are those of cotton sale societies particularly in Bombay and Madras—judged by the volume of sales and profits earned for producers. The success of these societies has depended largely on the response made by producers to the efforts of the Agricultural Department to spread improved strains of cotton. Some of them indeed started as seed societies, controlled and guided by the officers of the Department of Agriculture, who naturally strove to find buyers of the new cotton at higher prices than of the older varieties. Even after conversion into sale societies, they did not give up the work of spreading new varieties, for which they received some subsidy from the Indian Central Cotton Committee. The Agricultural Officers supervised cultivation work and also graded and classified the cottons. Such graded cottons naturally commanded higher prices. They would not do so unless the varieties were very widely adopted and a large and steady supply of uniform quality were pouring into the market systematically. Small quantities offered by a few individual improvers could not withstand the competition or boycott of a ring of merchants. Indeed such breakdown would be a setback to agricultural improvement in the tract. There is thus an intimate connection between co-operative sale and agricultural improvement.

Co-operative sale of milk is coming into prominence in the cities and large towns of India. The usual organisation is the milk supply union with its headquarters in or near the city to which are affiliated a number of societies in the neighbouring villages with

members having cows or buffaloes, more often as a sideline to agriculture. The milch cattle live under better conditions than in the congested city environment and the quality of milk is richer. But conditions of transport are far from satisfactory and pasteurisation of milk done at headquarters in the bigger unions is not as effective as it would be if conditions of transport and of handling in the initial stages in villages were better. The more serious handicap is the continuance of milch cattle in the city, which really ought to be shifted to rural tracts in their own interests as well as in the interest of public health. A great deal of improvement in the methods of breeding milch cattle and of growing fodder is necessary before the milk supply can be made a paying proposition for producers and brought within the reach of masses of poor consumers in our country. The help of a host of livestock and agricultural experts would be needed if the problem of milk supply should be satisfactorily tackled by co-operative organisations. Co-operative supply cannot for long compete with private suppliers and survive them without a vigorous programme of improvement of breeds and of fodder supply. This programme cannot be carried out in a country where the individual herd is so small without a co-operative organisation of producers. Animal husbandry is bound to be a sideline to the growing of cereal or other crops in most parts of the country and especially in wet land areas. To be economic and to utilise the by-products of the farm, the individual herd must be small, especially where draught cattle have also to be maintained.

Outside India the most successful of agricultural co-operative societies is the society for production and sale, the earliest and the most typical of which is the co-operative creamery or dairy. The surplus milk in rural tracts, far removed from populous centres of consumption, is converted into butter and sold abroad by the butter export organisation which could bargain for the best price. The skimmed milk is returned to members for feeding the pigs kept for bacon production—invariably a by-industry in the dairy tract. Denmark was the earliest home of the co-operative dairy where all the butter produced was exported, through a bottle neck as it were, to Britain. Later on other countries in Europe and overseas have developed a formidable dairy industry mostly on co-operative lines. India, however, does not have any dairy society of the Danish model. Our demand is not for creamery butter but for ghee. Cold drawn creamy butter does not yield good ghee; it becomes waxy and does not have the grain or flavour of home-made ghee, and it does not keep like the latter.

The supply of pure ghee is far short of the demand and with the advent of hydrogenated and refined vegetable oils like Marvo, adulteration has become far too tempting. There is practically no pure ghee available in the urban or even in the larger rural markets. Ghee societies have been organised in the United Provinces which merely collect and sell the ghee made at home by individual members. It is doubtful whether with the best precautions of societies and even good intentions of members, genuine ghee can be collected and marketed. In our view large quantities of uniform, clean and pure product can be guaranteed only when ghee production becomes amenable to centralised manufacture as in the case of butter in Denmark. The Imperial Dairy Institute's method of making ghee by the use of citric acid is claimed to yield better and more ghee compared with the country method 'of natural souring.' Making of ghee direct from cream by heating it in a special boiler is also in the experimental stage. If these experiments are successful and good ghee can be made on a large scale and use be found by propaganda and otherwise for all the skimmed milk and buttermilk—not so well relished now—the day will not be far distant when we may have a flourishing ghee industry more or less on the model of the Danish Co-operative Creamery.

There is a strong case for the co-operative manufacture of sugar or at least cream jaggery from sugarcane. South India is better fitted to grow the best varieties of cane than Northern India but it has a disproportionately small acreage under cane. A formidable obstacle to the expansion of the area is the difficulty of the disposal of cane after it is harvested. There are not enough factories to absorb the canes at a reasonable price. If it is too much for small farmers to establish a factory of their own on co-operative lines as at Vuyyur, it is up to them or to their well-wishers to organise smaller jaggery making societies with power crushers and improved furnaces. Not only would this reduce the cost of production of jaggery and thus stimulate the market for it, but it could help the producers concentrate their attention on cultivation.

There is ample scope, and from the point of view of agricultural improvement great need, for the co-operative ginning and pressing of cotton and decortication of groundnut. Success in these lines has been demonstrated in Bombay and Madras. What is needed is further extension.

III. *Effects of Land Tenure and Taxation.*

Conditions of tenure and taxation of land play an important part in promoting or impeding agricultural improvement. For

more than a century in Great Britain leadership in farming was in the hands of landlords who had enlarged and enclosed their estates by buying off the numerous strips of yeoman farmers, often with the profits made in trade, and invested capital in long-term improvements like drainage works and farm buildings and did pioneer work in the cultivation of better crops and the breeding of pedigree stock. It is the success of these ventures that made Britain the pioneer of modern agriculture, as well as of large-scale manufactures. This period of prosperity lasted for over a century—from 1750 to 1870. After 1870, however, American competition killed cereal farming; there was a continuous fall in rents, while the cost of cultivation, particularly wages, increased. Arable farming gave place to grass farming and stock-raising. Industries were more paying than agriculture. Industrial magnates bought land more for its amenities and social prestige than for its profits as a farm enterprise or for the love of agricultural research. Research indeed passed into the hands of several specialists and it was beyond the capacity of any landlord to set himself up as a leader in science or technique. Continuous increase in income-tax and death duties led to the break-up of big estates and many old farmers became, in the first thirty years of this century, occupying owners with the help of the State. But a decade of falling prices has impoverished these owners too, who have little capital left to work their farms. Small holdings in certain specialised lines of agriculture like dairying, fruit culture and vegetables are still favoured, but for staple cereals large scale mechanised farming with State ownership of land and control of cultivation is advocated.

It is strange that when such radical changes have been going on in Britain for many years now, so many British administrators coming over to India even in recent years should harp upon the British tradition of landlord-leadership in scientific agriculture and appeal to the landed aristocracy in India to give a lead in agricultural improvement.

We can understand Lord Cornwallis, the author of the Permanent Settlement in 1793, expressing the hope that the zamindars (in Bengal) would exert themselves to spread and improve cultivation in their estates, of which they had just then been made proprietors and assured immunity from enhancement of *peishkush* which they had agreed to pay. He had evidently in his mind the contemporary English 'improving landlord.' Some zamindars no doubt had the jungles cleared, canals cut, tanks dug, and temples and ghats built.

The area of cultivation was extended. But there were few zamindars either in Bengal or in other provinces, where the Permanent Settlement was soon after introduced, who took any active interest in cultivation, even on their own home farms, of the better types of crops with better implements and fertilisers or in the improvement of livestock, the breeding and rearing of which were carried on by backward tribes. Most of the zamindars went on rack-renting with the growing competition for land, using their power to evict tenants as a lever to enhance the rents. Even after the enactment of tenancy laws, the provisions for the commutation of kind rents, for the occupation of old wastes, and the summary recovery of dues were all abused to such an extent that tenants have been crying for reduction of rates to the levels prevailing in neighbouring ryotwari areas, which are themselves quite high.

The abuse of the system reached its worst in Bengal, where most of the zamindars became absentee landlords and a series of intermediate tenure-holders with rights of their own have sprung up between the zamindars and the actual tillers of the soil. The ryots in other zamindari tracts too are not all cultivators; many of them let out their lands, of which they have now occupancy rights, to impecunious labourers for a fixed or sharing rental. Such a dissipation of interests in cultivation is not conducive to any improvement in agriculture.

Nor are all the ryots in ryotwari areas cultivating their holdings. Big as well as small ryots have mostly fragmental holdings; little or no attempt is made to consolidate and improve them; and the different fragments are generally sub-leased to different petty tenants-at-will, most of whom live on the margin of subsistence. Those who cultivate on the *varam* or crop-sharing tenancy system—analogue to the metayage in Europe—either as tenants of zamindars or of ryots have the least incentive to effecting any improvement. Where, however, fixed cash leases are the rule, as in the case of valuable commercial crops, and the tenants are men of resources and spirit of enterprise, they invest capital in the purchase of better seeds and manures. Except in the case of tree crops, as in Malabar, such tenants are not anxious to stick to the cultivation of particular pieces of land. They move from one land to another paying rents according to soil, irrigation and market facilities.

The Royal Commission on Agriculture pointed out incidentally—land tenure was outside the terms of reference—that large scale

farming 'though open to many is practised by few'. Among the reasons given, tenancy legislation, the primary object of which was to confer security of tenure on ryots in the estates, is said to have rendered it difficult for large land-holders to obtain unrestricted possession of compact blocks of land. But we wonder if many of them are yearning to practise scientific farming for the benefit of themselves and their ryots, after missing splendid opportunities to set up model home farms in the past.

Sir John Russell reviewing the progress of agricultural research and its application in India in 1937 lamented the lack of an agricultural aristocracy analogous to the British landlords or the large farmers, "rooted in the soil and ready to try any improvements suggested by experimental stations and anxious themselves to devise improvements, which are sometimes better than those of the experimental stations." Whatever the past might have been, recent investigations like those of Astor and Rowntree tell a different and distressing tale of large farmers in Britain.

In respect of dairy industry again, Mr. F. Ware, an authority on animal husbandry, has suggested that "the wealthy landowning classes of the country might give their support by maintaining high grade herds of pure bred indigenous dairy cattle and by supplying approved sires for use in the villages."

Agricultural reform in other European countries took a different turn from that in England. After the Napoleonic wars, measures were taken to abolish serfdom on land in most of the Western European countries; and the Code Napoleon established equal inheritance of land among all the sons of a father. With the growth in population in the 19th century holdings naturally tended to become smaller in size. There were few landlords left of the type of English landlords, except in East Prussia. In fact the State offered little encouragement for the growth of big estates, while steps were taken to break them up and settle the workers as proprietors. Consolidation of fragmented holdings was effected by permissive legislation in most countries and the subdivision of holdings below the minimum economic unit was prevented by law. There was indeed little of the worship of the large estate as in England, though the economies of large-scale production and marketing were before long appreciated. Such economies were effectively realised by the variety of co-operative organisations, most of which were inspired by the spur of necessity to meet the American competition. It was found that in respect of production in certain

lines, small holdings were by no means inferior to large ones, and much of the land was devoted to such specialities. The processing and marketing of such crops demanded more of co-operative effort, and hence it is that all over Western and Northern Europe, co-operation has been treated as a necessary complement to peasant proprietorship. For instance, in Denmark it is not the big farmer that is reputed to breed and rear good cows. More than 90 per cent of the herds consist of less than 15 milch cows each. Though Denmark took up the development of dairy breeds long after England, the red Danish cow is not inferior to any English breed in respect of yield of milk and butter fat. This has been achieved by the co-operation of the State department and the peasant co-operatives for milk recording etc. Progress has been achieved in smaller lines—in the production of oats, barley and potatoes by Belgian peasants and in the raising of wheat, fruits and vegetables by the Dutch peasants almost entirely by their multifarious co-operative organisations. Scandinavian and Baltic States achieved equally remarkable progress by co-operative methods. An agrarian reform amounting to a revolution was effected in Central and Eastern States of Europe after the last war by the conferring of ownership rights on cultivators and by the break-up of big estates, which were not fully compensated; and even here co-operation was called in to the aid of the new peasant proprietors.

With such splendid models before them of progress achieved by peasants co-operatively organised, we wonder why the British authorities should still go on appealing to effete landlords instead of earnestly helping to build up a sound, all-round, co-operative movement, which has been the greatest instrument of agricultural progress all over Europe. Perhaps as Mr. L. D. Gammans of the Malayan Civil Service says: "The Englishman in the East is probably more ignorant of co-operation than most other Europeans. With the exception of consumers' store, which does not appeal to any great extent to the educated classes from which the British official is largely recruited, co-operation in Great Britain is little developed. The ordinary Englishman is apt to know little of its other possibilities and is less conversant with the co-operative organisation of agriculture than the German, the Dutchman, or the Dane."

Though peasant proprietorship is, on the whole, the best system of tenure in India where capitalistic or socialistic large scale farming is out of the question on account of the nature of crops,

the scarcity of land and the abundance of labour, it is neither possible nor desirable to do away with tenant-farming. There are good cultivators who do not like to have their little capital locked up in the purchase of land, which is better used in working the farms that they take up for lease from time to time. An impartial tribunal that will fix up fair rents and compensate for loss for any premature eviction, combined with facilities for co-operative credit, supply and sale would for them be ample substitutes for the 'magic of property' in land.

In fact co-operative societies may be organised by tenants who can take on lease a large piece of land or several pieces from one or more landlords. Joint farming may be tried or at least an attempt may be made to consolidate cultivation units and each member may take charge of one unit. The bargaining power of such co-operative ventures will be greater than that of petty individual tenants competing among themselves. The advantage may not be on the side of tenants alone. Many an absentee landlord and institution owning land, not to speak of reasonable local landlords, would be pleased to deal with a well-knit co-operative organisation than with a number of poor tenants. Agricultural graduates can play a great part if they can organise and manage such societies taking on lease the lands of temples, endowed charities and institutions and the lands that have come into the hands of co-operative banks, insurance companies, etc., even as their confreres in America have organised themselves into agricultural management companies for a similar purpose. They can serve as managers and share the profits of the enterprise with all the working members. They can set a higher standard of cultivation and reduce the evils of a recklessly competitive and wasteful tenancy system.

Land revenue in ryotwari areas, assessed on the theory of State landlordism and revised only in 30 years, was felt to be a heavy burden even in periods of rising prices. It is certainly oppressive in a period of falling prices and intolerable in years of drought, when remissions are by no means liberal. At any rate the rigidity of the rate with no automatic provision for remission in years of scarcity of rains, or of fall in prices, is not conducive to the investment of capital in agricultural improvements except of the kind, like sinking of wells for which provision has been specially made for exemption from enhancement of rates. This exemption has surely given a great fillip to the digging of wells and the mechanical lifting of water in some districts. The exemption need not indeed be permanent, but may be reduced to a period of 30 or 40 years as in the Punjab, without detriment to improvements.

The comparatively well-off ryots dissipate their extra earnings got in years of better yield or higher prices, or divert them to the purchase of more land rather than invest them in any substantial improvements on the land they already have. Agricultural experts should look for such opportunities and induce such earnings to be invested in improvement of land or purchase of plant like the water-lift, tractor-plough, cane-crusher etc.

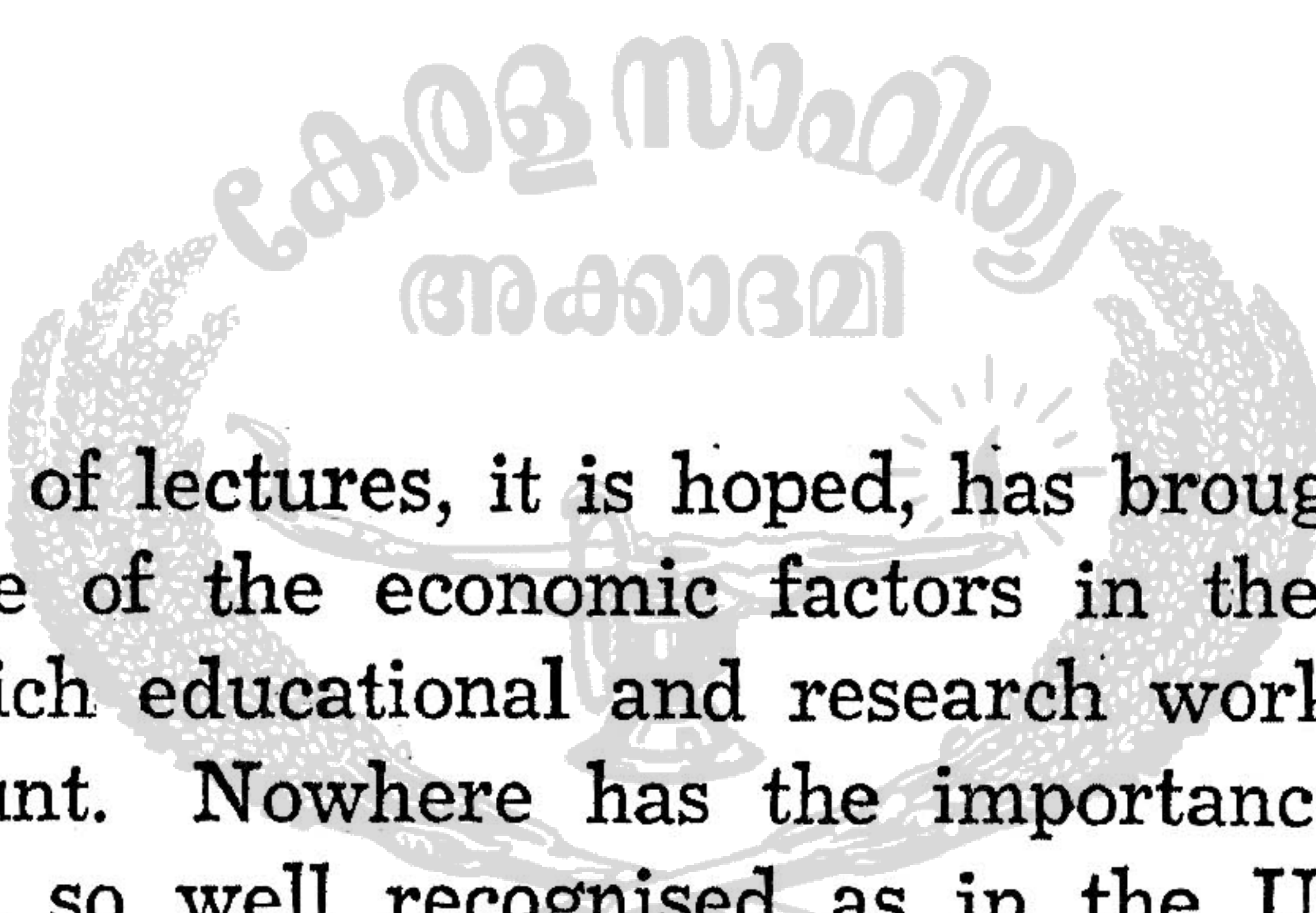
Land revenue is said to be a tax on land and not on persons and is being imposed on all alike. It is a regressive tax pressing unduly on the poor, who have in good years little left to spend on improvements. Taxation of higher agricultural incomes, over and above a reduced flat rate of revenue, is bound to be introduced in all provinces, as it has already been done in Bihar and Assam. With a view to encourage greater productivity on land, concessions may be shown for improvers of land and crops by making liberal allowances for expenditure on improvements of approved types.

The existing system of taxation of water is not scientific and it leads to a lot of waste of water and injury to the land. But volumetric taxation of water would be costly to administer without a system of co-operative distribution of water among the users. Exemption of charges now granted for the use of water in growing green manure crops may well be extended to use of water for raising fodder crops in areas with a deficiency of fodder. A part of the local land cesses now spent by local bodies on a variety of objects may be earmarked for agricultural improvements by the organisation of propaganda, demonstration and systematic instruction by itinerant teachers employed by District Boards, even as County Councils are doing in Great Britain.

Export duties on manurial resources like oilseeds, bones and fish have been time and again recommended by agricultural experts with a view to bring down their prices and induce greater use within the country, so as to conserve soil fertility and produce better yields. Such duties might in the first instance hit producers of such materials, though the merchants would be hit more; but in the long run they would stand to gain by greater demand within the country and the reduction of middlemen's profits in internal trade.

Import duties on competing foreign produce with a view to stabilise the prices of home produce have been freely resorted to in almost all European countries. But for over a century the free trade policy of Great Britain has stood in the way of any similar

protection to her crops, and incidentally to our crops too even when the need has been felt for it in recent years. South Indian producers, having to incur greater costs of cultivation on older soils and irrigated lands, have been crying in vain for protection from Burma and Siam rain-fed rice and Ceylon plantation copra. The greatest and the most successful departure from free trade tradition has been made in the case of sugar—though more in the interests of manufacturers than of cultivators—and this accounts for the sudden expansion of sugarcane area even in South India, which really is better fitted to grow cane than North India, but suffers from want of factories to absorb the canes grown. An extension of such protection to other crops may be opposed on the score of the poverty of consumers. There is also the danger that it may remove an important spur to improvement; for the temptation to go to sleep behind the tariff wall is greater in this country.



This course of lectures, it is hoped, has brought out the dominant importance of the economic factors in the development of agriculture, which educational and research workers will have to take into account. Nowhere has the importance of agricultural economics been so well recognised as in the United States. It would, therefore, be fitting to conclude this course with an extract from a statement made twenty years ago by H. C. Wallace, the famous Secretary of Agriculture, who organised the Bureau of Agricultural Economics.

“ Help in their economic problems is now the most urgent need of our farmers. This is not to say that the Department is losing sight of production matters. The farmer needs all the help in his production problems that the Departments of Agriculture, Colleges and experimental stations can give him; but the need of the most importance now is the development of an entirely new realm of organized knowledge bearing upon the economic factors of agriculture, looking towards cheaper production, improved methods of distribution, and the enlargement of markets, all to the end that the prices the farmer receives shall be more fairly related to his cost of production.”

STUDIES ON THE CHEMISTRY AND BIOLOGY OF PONDS IN THE MADRAS CITY

SEASONAL CHANGES IN THE PHYSICAL AND CHEMICAL CONDITIONS OF A GARDEN POND CONTAINING ABUNDANT AQUATIC VEGETATION

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1. Introduction

In my paper on "The Ecology of a temple containing a permanent bloom of *Microcystis aeruginosa*" I have explained the object of these studies. The pond now under investigation typically represents the first of the three groups of ponds found in Madras, namely, those containing abundant floating and submerged macrophytic vegetation: and it may therefore be compared to the littoral region of temperate lakes or swamps of the tropics. They are sources of serious trouble to the Municipal Corporation as they afford breeding places for the larvae of malarial mosquitoes. They are also of great scientific interest inasmuch as they contain scarcely any phyto and zoo-plankton. The seasonal variations in the physical and chemical conditions of their waters are not so well known as those of lakes (Carter and Beedle 1930-32) and this aspect of the subject has been comparatively neglected in India (Bharadwaja 1940). An attempt has therefore been made in this paper to trace the changes during a year in one of the garden ponds of Madras.

This pond is situated mid-way between the office building and the Hostel attached to the Y.W.C.A., Vepery, Madras; and is nearly rectangular in shape and measures about 300 feet long, 150 feet broad and 4 feet deep at full pond level. Its bottom is almost flat so that its depth is nearly uniform at all places in the pond. On the east, north and south, tall trees with leafy branches cast their shadows, while the west end is open. It receives the drainage from the kitchen and the bathroom of the hostel, throughout the year. Also, it gets filled up during the north-east monsoon season, when the storm water from the compound is allowed to drain into it.

Quite possibly, it may also receive a small quantity of spring water. Its banks are grassy and vary in width during the different seasons of a year. At full pond level, the outer margin slopes rather sharply towards the water. Its bottom is covered with soft accumulated deposits of organic debris in most places.

Observations on the physical and chemical conditions of the pond water and on the nature of its aquatic vegetation were made once a fortnight or more often once a month between February 1934 and January 1935. Samples of water were collected just below the surface of water from nearly one and the same place on the eastern side between 9 and 10 a.m. The results are shown in Table II. Table I contains the meteorological data of the period covered by the investigation.

2. Meteorological Notes

(a) *Temperature*.—The average daily temperature of the atmosphere varied from a minimum of 74.9°F (in December) to a maximum of 87.5°F (in May). There was a gradual rise from February to May when the maximum for the year was reached and from May onwards there was a gradual fall till December, when the minimum for the year was reached. There was a rapid rise from the end of the cold weather period to the beginning of the hot weather period; but there was a sudden drop from the end of the hot weather period to the beginning of the south-west monsoon season, and also from the end of the south-west monsoon season to the beginning of the north-east monsoon season.

(b) *Hours of bright sunshine*.—The number of hours of bright sunshine varied from a minimum of 5.6 (July) to a maximum of 10.8 hours (February and May). The hours of bright sunshine varied between 9.7 and 10.8 during the hot weather period; between 5.6 and 8.0 during the south-west monsoon season; between 6.4 and 7.9 during the north-east monsoon season and between 7.6 and 10.8 during the cold weather period. The maximum number of hours was recorded during the hot weather period and minimum during the south-west monsoon season.

(c) *Percentage of cloudy day*.—The percentage of cloudiness varied from a minimum of 28 (February) to a maximum of 83 (July). The sky was most cloudy during the north-east monsoon season and least during the cold weather period.

(d) *Total Rainfall*.—The rainfall varied from a minimum of nil (February) to a maximum of 16.82 inches (October). There was

a gradual increase from February to October when the maximum for the year was recorded and thereafter there was a considerable decrease. Maximum rainfall was recorded during the north-west monsoon season and minimum during the cold weather period.

(e) *Wind Velocity*.—The velocity varied from a minimum of 152 miles per day (February) to a maximum of 235 miles (December). A gradual increase in the wind velocity was noticed from February to May, when the first maximum was reached; from May onwards, there was a decrease till August; and again from August there was a rise till the second maximum was reached in December. From December 1934 to January 1935 there was a decrease.

3. *Aquatic Vegetation*

There were two types of vegetation, in the pond; floating and submerged. The former was represented by two members of Nymphaeaceae—the yellow water lily, Nuphar and the white water lily, Nymphaea—and the latter by *Hydrilla verticellata* and *Najas flexilis*. On 8th March, the lilies were found to cover nearly the western half of the pond, while they were found growing scattered in the eastern half. This condition prevailed till 2nd August when all the plants were found to have been removed. They were seen again growing from 6th September to 30th January in the same manner as observed on 8th August.

As regards the submerged type of vegetation, the most dominant plant was *Hydrilla verticellata*, which was found to cover the entire bottom of the pond. Next in order of abundance came *Najas flexilis*, which was found growing more in the western than in the eastern half of the pond.

Rotting vegetation of *Hydrilla*, *Najas*, and *Spirogyra* sp, was seen all round the water margin on 27th April, May and June when the level of water was very low. All the plants were found to have been completely removed on 14th June and again on 22nd August by the Health Department of the Corporation. They were found growing again from 6th September to 30th January 1935.

4. *Physical Conditions*

1. *Temperature of water*.—Table II shows that the amplitude of variation was from a minimum of 25.8°C in December to a maximum of 32.4°C in April. The temperature curve showed a gradual rise from February to April followed by a fall till August,

when there was a rise again accompanied by a fall. The temperature changes of the water seemed to follow those of the atmosphere.

2. *Colour*.—It was brownish and clear throughout the year.

5. *Chemical Conditions*

1. *Dissolved oxygen*.—The oxygen content was found to vary from a minimum of 2.30 cc/l on 22nd August to a maximum of 10.03 cc. on 21st June. The water was found to be supersaturated on 22nd February, 21st June, 14th July and 23rd November. The oxygen content was fairly high in the hot weather and in the first half of the south-west monsoon season, and lowest in August and high again in the north-east monsoon season.

The fluctuations in the oxygen content of the pond water did not seem to follow the law of solubility of gases. A careful study of the temperature and oxygen curves shows that with the increase of temperature oxygen also increased on 27th April and 19th September; and with the decrease of temperature oxygen also decreased on 26th May, 8th and 22nd August. From the above it would appear that the law of solubility of gases was not the deciding factor. This point is clearly illustrated by the oxygen saturation graph also. Therefore, the explanation for the observed variations in the oxygen content has to be sought in the respiratory and photosynthetic activities of the vegetation and in the content of organic matter in the pond.

The amount of dissolved oxygen, generally, was high from 22nd February to 14th July while it was low in August and September. It was not so high in the north-east monsoon season as in the cold weather and hot weather periods, when the average number of hours of bright sunshine was higher. This observation therefore, would seem to indicate the dependence of dissolved oxygen upon the intensity of bright sunshine, when the submerged plants are able to carry on active photosynthesis.

Another factor of importance which accounts for the presence of large amounts of dissolved oxygen, in a piece of water, is the abundance of chlorophyll-bearing plants. The greater their abundance, the greater the photosynthetic activity, and consequently the greater the possibility of the production of oxygen. As has already been stated, this pond water contains an enormous amount of macrophytic vegetation resembling an East African Swamp, in a shallow depth of water. The supersaturated condition on 22nd February, 21st June, 14th July and 23rd November can be ascribed only to predominance of the photo-

synthetic activities of the plants over their respiratory activities. Again the high oxygen content viz., 6.68 cc/1 on 23rd November, when the water was supersaturated (153.7%) shows that the photosynthetic activity was greater than the respiratory activity even in the north-east monsoon (October to December). On other dates, consumption of oxygen exceeded production. This fact would show that the processes of absorption of oxygen dominated over those that discharged it, and that unfavourable conditions for photosynthesis were present on those dates. Decomposition of organic matter rather than its synthesis was possibly then going on in the pond.

2. *Free Carbonic acid*.—Excepting on one occasion free carbonic acid was absent throughout the period of investigation. Its presence on 22nd August has to be attributed to the thoroughly altered conditions of the pond water resulting from the removal of all the plants from the pond, a few days prior to the day of sample collection. Its absence on all other days may be explained as being due to its utilisation by the abundant macrophyta, or to the high temperature of water with the consequent liberation of carbon-dioxide into the air (Welch 1935).

3. *Hydrocarbonates and Bicarbonates*.—The hydrocarbonates varied from a minimum of 0.3 part on 6th September and 26th October to a maximum of 4.80 parts per 100,000 on 27th April 1934. They were found to increase generally from the cold weather period to the first half of the south-west monsoon season and to decrease thereafter.

Bicarbonates varied from a minimum of 0.92 part on 22nd February to 17.54 parts per 100,000 on 22nd August. They were least during the cold weather period and highest during the south-west monsoon season. They increased from the cold weather period till the maximum was reached in the south-west monsoon season, and were found to fluctuate during the rest of the year.

From a study of the figures for carbonates, bicarbonates and dissolved oxygen, the whole year can be roughly divided into two periods; the first period i.e., February to July when the carbonates were high, bicarbonates low (exceptions being June and July) and dissolved oxygen high and the second period i.e. August '34 to January '35, when the carbonates were low, bicarbonates high and dissolved oxygen low. The former may be considered as one of very active photosynthesis or as a period of greater formation than destruction of organic matter and the latter as one of mild photosyn-

thesis or as a period of greater decomposition than formation of organic matter, from the viewpoint of oxygen saturation of water.

4. *Hydrogen-ion concentration (pH).*—The pH values varied from a minimum of 8.2 on 6th September to a maximum of 9.3 in April and May. They were highest in the hot weather and in the first half of the south-west monsoon season, and lowest in the latter half of the south-west monsoon and north-east monsoon seasons. It is well known that the pH value of a piece of water is influenced by the amount of carbonates of calcium and magnesium and the CO_2 tension. The latter in its turn is influenced by temperature, and the photosynthetic activity of the vegetation and animal life in the water. In the pond under investigation, excepting for larvacidal fish introduced into it for destroying malarial mosquito larvae, animal life was poor, so that the chief factor controlling the pH appears to be the vegetation.

The data for pH and temperature of the water show that the former increases in the hot weather and in the first half of the south-west monsoon season, when the latter is fairly high (over 30°C). The maximum pH values are followed by a fall in the second half of the south-west monsoon season, when the temperature of the water is generally less than during the former periods. It would, at first sight, therefore, appear that changes of temperature control the pH values of the water in the pond.

That it was not really so, is shown by the results for temperature and dissolved oxygen on 22nd August and 6th September, 25th October and 23rd November and 13th December and 30th January '35. The decrease in pH, especially in the second half of the south-west monsoon and north-east monsoon seasons might be due to the rotting vegetation, which had increased the bicarbonate content. Not until February, however, is there a sharp rise in pH indicating greater assimilatory activity of the chlorophyll-bearing plants in the water. Again, the high pH values (8.2 to 9.3) of the pond water should be due to the same cause by which calcium carbonate is precipitated and pH 9.0 is reached (Atkins 1922).

Atkins and Harris (1924) have taken the criterion of saturation of their tank water according as its pH values were at or always above 8.1. This pond water whose pH values have always been above 8.1, must be considered, according to that criterion, always saturated or supersaturated with oxygen. But it was not so saturated. Excepting on 22nd February, 21st June, 14th July and 23rd November, it was under-saturated on all other dates. These observations show that no such generalisations as has been made by

Atkins and Harris can be made in the case of ponds which contain excessive aquatic vegetation. A conclusion similar to mine has been arrived at by Kolkwitz (1914) and Pearsall (1923).

The data for pH, carbonates, bicarbonates and dissolved oxygen show intimate relationship on a few occasions. On the 11th April, 19th September, and 23rd November there was an increase in oxygen, carbonates and pH and a decrease in bicarbonates over the corresponding figures for 27th April, 6th September and 25th October.

5. *Total Solids*.—The figure varied from a minimum of 30·6 parts on 22nd March to a maximum of 117·6 parts per 100,000 on 22nd August. There was also a seasonal change, which was high during the latter half of the south-west monsoon season and low during the hot weather period. The decrease in March, April and May was probably due to the precipitation of the carbonates of calcium and magnesium, and the increase during the south-west monsoon season (June to September) to the dissolution of the precipitated carbonates of calcium and magnesium by carbon dioxide which resulted from the decomposition of organic matter by bacterial action.

A study of the data for solids and pH confirms the above conclusion. When the pH is high (9·1—9·3) as in the hot weather period, the values for total solids are low, and when the pH is low (8·2 to 8·4) as in the latter half of the south-west monsoon season, the values for total solids are generally high.

6. *Total Hardness*.—The figure varied from a minimum of 12·0 parts in March, April and May to a maximum of 32·0 parts on 22nd August. It was the same (12·0 parts) during the hot weather period and gradually increased in the south-west monsoon and decreased during the north-east monsoon season.

The low figures in the hot weather period were due to the precipitation of the carbonates of calcium and magnesium due to photosynthesis by the aquatics in the water; and the high figures during the south-west monsoon season to increase in the content of bicarbonates; and the low figures again during the north-east monsoon season to dilution on account of rainfall.

7. *Phosphates*.—They were found to vary from a mere trace or nil on 14th July to a maximum of 0·006 on 13th December. They were very low from March to August and high during the rest of the year. Throughout the year their production continued from excessive plant remains by bacterial action. Carter and Beadle (1930-32) found that the concentration of phosphates was

higher in the tropical Paraguayan Chaco than in temperate lakes of the same type, and Carter (1932-34) reported that they were absent from the open water of the tropical East African swamps.

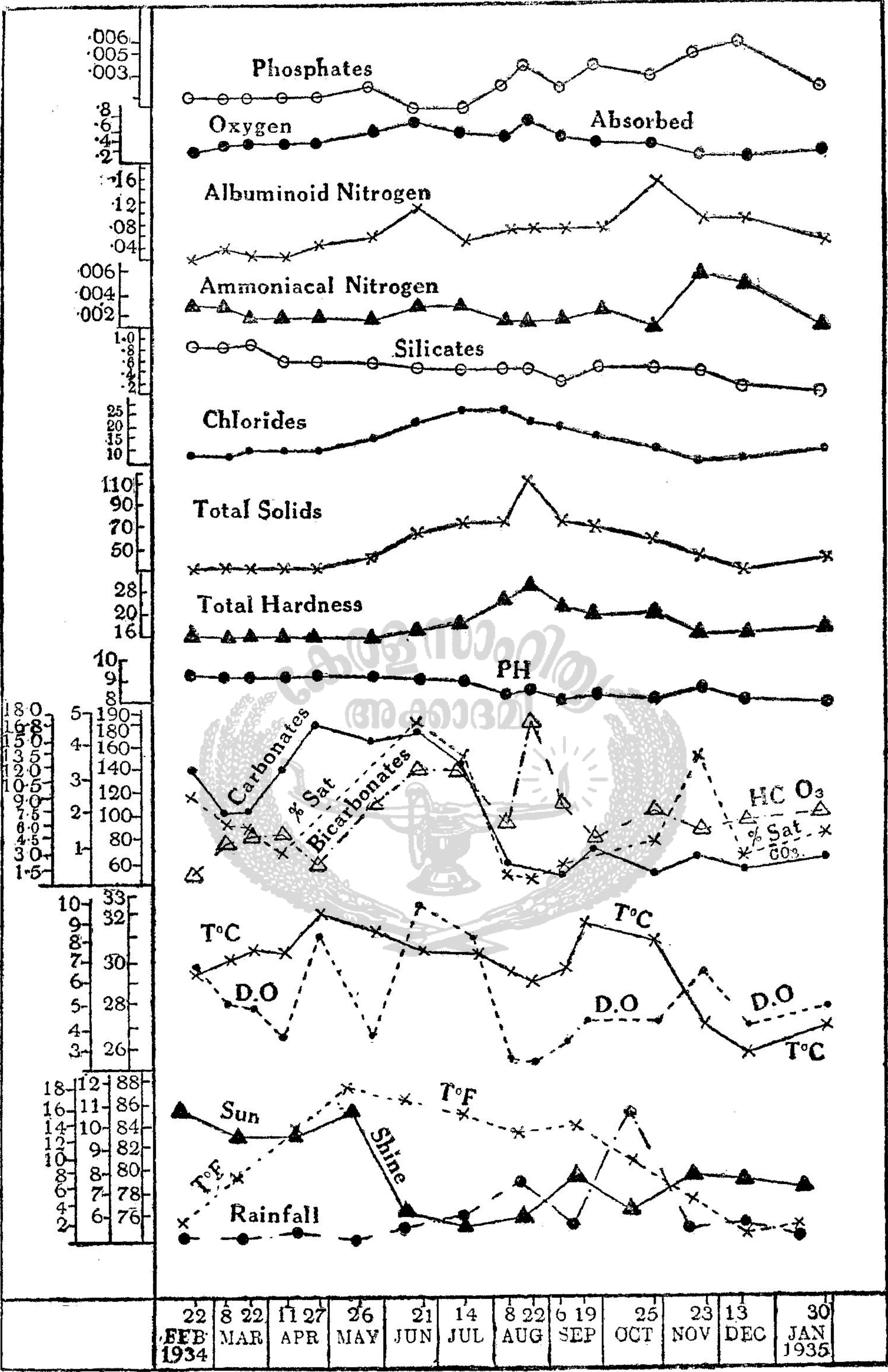
8. *Silicates*.—These were found to vary from a minimum of 0.16 part in January '35 to a maximum of 0.90 part on 22nd March '34. They were high during the hot weather and south-west monsoon seasons, when the water was more alkaline and low during the north-east monsoon season when the water was comparatively less alkaline. Also one should expect a greater amount of silicates on account of the high alkalinity of the pond water, but the quantities were not really very high. "It is probable that the temperature changes affect the solubility of the soil silicates and their rate of hydrolysis resulting in the precipitation of silica" (Atkins and Harries l.c.).

9. *Chlorides*.—They were found to vary from a minimum of 5.54 parts on 13th December to a maximum of 29.5 parts per 100,000 on 14th June. They were very high during the south-west monsoon season and very low during the north-east monsoon season; and they increased gradually from February to June when the maximum for the year was reached and decreased thereafter till the minimum was reached in December. The high content of chlorides in the south-west monsoon season was due to low level and the resulting concentration of the pond water and the low content in the north-east monsoon season to dilution due to increased level on account of rainfall.

10. *Organic matter (Tidy's 4 hours test) and its decomposition products*.—(a) Organic matter was found to vary from a minimum of 0.167 part in December to a maximum of 0.70 part per 100,000 on 22nd August. It was least during the north-east monsoon season and highest during the south-west monsoon season. This was also found to increase gradually from February till the maximum was reached on 22nd August and to decrease thereafter till the minimum was reached on 13th December.

(b) *Ammoniacal nitrogen*.—This was found to vary from a minimum of trace on 22nd March to a maximum of 0.006 part per 100,000 on 23rd November. It was found to be very low (trace to 0.003 part per 100,000) in the cold weather, hot weather and south-west monsoon periods and comparatively high in the north-east monsoon season.

(c) *Albuminoid nitrogen*.—This was found to vary from a minimum of 0.022 part on 22nd February to a maximum of 0.176 part on 25th October. It was found to increase from February till



June, when the first maximum was reached; and thereafter to decrease in July and to increase again and to remain almost the same in August and September and to reach the second maximum again in October and finally to decrease.

(d) *Nitrous and Nitric nitrogen*.—They were absent throughout the year. In this pond, aquatic vegetation has been stated already to be abundant. By its death and decay, it adds organic matter to the water. The greater the organic matter in solution, the greater will be the decomposition by bacterial action, so that the greater will also be the products of its decomposition. This relationship appears to hold good only from February to September, i.e., the period during which the conditions for existence in the pond are not altered considerably by external factors such as heavy rainfall. A study of the data and graphs for oxygen absorbed and albuminoid nitrogen shows this point clearly.

Therefore, one should expect during this period, an increasingly large amount of ammoniacal and albuminoid nitrogen, nitrites and nitrates, these being the final products of decomposition of organic matter. But no such progressive increase in all the factors excepting albuminoid nitrogen has been noticed. The cause for the absence of nitrites and nitrates has to be explained. It is well known that they constitute the most important nutrient substances for productivity in any piece of water. It is, therefore, quite probable that they are consumed by the abundantly growing aquatic vegetation in the pond as soon as they are formed (Atkins 1932-33). Ammoniacal nitrogen also is not found in great quantities and it can also be utilised by phyto-plankton (Cooper 1933). So it appears that it has been used up by the plants leaving behind only a very small quantity in the water. But the question may arise whether the plants consume directly the ammoniacal nitrogen being "the earlier product of nitrogenous breakdown", or only after its final conversion into nitrites and nitrates or in all states. A partial answer to this query has been furnished by the recent experiment of Harvey (1940) who found that (a) communities of diatoms could use all the ammonia directly and (b) that they utilized all the ammonium before any material quantity of the nitrate was used, although the latter was 60 times more concentrated at the beginning of the experiment and many times more towards the end. It appeared to him that they used up ammonium in preference to nitrate although the latter might be many times more concentrated than the former. It is quite probable that the higher plants in the pond under investigation, used up the ammoniacal nitrogen rapidly as soon as it was formed (Russel 1923), so that there was either no time or not suffi-

cient free ammonia left, for its conversion into nitrites and nitrates. That was probably the reason why neither nitrites nor nitrates have been found at any time in the pond water. Even if they had been formed their absence later can still be explained as being most probably due to the action of denitrifying bacteria, which are stated to be very active at higher temperatures such as those recorded for the pond water (Pia 1934). Which of these processes is taking place in the pond remains a problem which has to be worked out generally for all tropical waters.

Again, a careful examination of the data for organic matter, albuminoid nitrogen and the percentage saturation of dissolved oxygen will show the intimate relationship that exists among them. When the figures for organic matter and albuminoid nitrogen are low, as in the hot weather period, the figure for percentage saturation of dissolved oxygen is fairly high and when the first two factors are high as in the south-west monsoon season, the third factor is comparatively low. These facts would, therefore, show, again, that during the hot weather period, the formation of organic matter was greater than its decomposition, while in the south-west monsoon season, the reverse was most probably taking place.

Summary.

1. The seasonal variations in the physical and chemical conditions of the surface water, for a year, in a eutrophic type of pond resembling the littoral zone of temperate lakes and swamps of the tropics, are recorded.

2. The year during which the investigation was made, may be roughly divided into two periods: the first period, from February to July '34, and the second from August '34 to January 1935; and the former may be considered as the period of the dominance of production over consumption of oxygen and the latter as one of dominance of consumption over production of oxygen.

3. Again in the first period, the temperature of water, dissolved oxygen, carbonates, pH and silicates were high, while the bicarbonate total solids, total hardness, phosphates, ammoniacal nitrogen, albuminoid nitrogen and organic matter were low; and in the second period, the temperature of water, dissolved oxygen, carbonates, pH and silicates were low, while bicarbonates, total solids, total hardness, phosphates, ammoniacal nitrogen, albuminoid nitrogen and organic matter were generally high.

4. The presence of an abundant growth of plants must withdraw most of the nutrient salts of biological significance from the

water. But yet most of them are present, at all seasons, in fairly large amounts which can enable the growth and multiplication of phytoplankton communities. The absence of any phytoplankton and rarity of any zoo-plankton is therefore inexplicable. Further work also is necessary to explain the presence in small quantities of ammoniacal nitrogen, and the absence of nitrites and nitrates in a pond of this type, in the tropics, where the possibilities of their formation and utilisation are great.

The author wishes, in conclusion to thank Rao Bahadur Dr. C. S. Govinda Pillay and Dr. P. Sadasivan for their interest in the work and Dr. M. O. P. Iyengar for help in the identification of the plants.

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TABLE I SHOWING THE METEOROLOGICAL DATA FOR
THE CITY OF MADRAS DURING 1934.

(Daily averages.)

Months.	Average Tempera- ture (F)	Hours of Bright sunshine	Percentage of cloudy day	Total rainfall (in inches)	Wind velocity (in mil. per day)
February 1934	.. 75.6	10.8	2.8	nil	152
March	.. 79.7	9.7	4.0	nil	165
April	.. 83.8	9.8	5.0	0.74	192
May	.. 87.5	10.8	4.4	nil	205
June	.. 86.7	6.2	8.2	1.76	167
July	.. 85.3	5.6	8.3	2.07	165
August	.. 83.4	6.0	7.8	7.17	148
September	.. 84.2	8.0	6.6	2.00	168
October	.. 81.0	6.4	7.1	16.82	169
November	.. 77.6	7.7	6.2	1.86	219
December	.. 74.9	7.9	5.9	2.19	235
January 1935	.. 75.3	7.6	5.5	0.57	211

TABLE II-A, Y. W. C. A. TANK, VEPERY, MADRAS.

Date	Time of collection	ϕ	D. O. cc/1	$\frac{w}{s}$ %	Parts per 100,000			pH	Transpa- rency in cms.	Colour of water	* Meteorological Conditions.
					Free CO ₂	CO ₃	HCO ₃				
22- 2-34	9-15 A.M.	29.6	6.62	118.1	Nil	3.30	0.92	9.3	Not found	Brownish	B.S.S. C.B.S. N.W.
8- 3-34	9-0	30.0	5.24	94.0	"	2.10	4.27	9.1	—	do.	do.
22- 3-34	9-40	30.5	4.90	88.7	"	2.10	5.80	9.1	—	do.	do.
11- 4-34	9-10	30.4	3.59	64.9	"	3.30	5.03	9.3	—	do.	do.
27- 4-34	9-15	32.4	8.41	—	"	4.80	2.75	9.3	—	do.	do.
26- 5-34	9-0	31.5	3.69	—	"	4.20	8.85	9.3	—	do.	do.
21- 6-34	9-0	30.6	10.03	181.9	"	4.65	12.20	9.1	—	do.	do.
14- 7-34	9-30	30.5	8.28	149.8	"	3.60	12.51	9.1	—	do.	do.
8- 8-34	10-50	29.6	2.70	48.2	"	0.75	6.10	8.5	—	do.	C.S. N.B.S.S. N.W. good rain two days before.
22- 8-34	9-30	29.1	2.30	40.7	0.33	—	17.54	8.4	—	do.	do.
6- 9-34	10-30	29.6	3.24	58.1	Nil	0.30	8.54	8.2	—	do.	do.
19- 9-34	9-30	32.0	4.37	—	"	0.90	4.57	8.5	—	Clayey	B.S.S. C.B.S. S.W.
25-10-34	9-30	30.9	4.09	74.5	"	0.30	8.08	8.3	—	do.	C.S. N.B.S.S. sampled just after rains.
23-11-34	9-15	27.2	6.68	153.7	"	0.75	5.95	8.8	—	Brownish	C.S. N.B.S.S. N.W.
13-12-34	9-30	25.8	4.05	68.0	"	0.45	7.65	8.3	—	do.	C.S. N.B.S.S. Good fall on the previous day.
30- 1-35	9-30	27.2	4.93	84.7	"	0.75	8.84	8.2	—	do.	B.S.S. No wind.

*B.S.S.—Bright Sunshine; C.B.S.—Clear blue sky; C.S.—Cloudy Sky; N.B.S.S.—Not bright sunshine;
N.W.—No wind; S.W.—Slight wind.

TABLE II-B, Y. W. C. A. POND, VEPERY, MADRAS.

Date	Parts per 100,000									
	Total Hardness	Chlorides	N ₂ Ab.	N ₂ Alp.	Nitrous N	Nitric N	Oxygen absorbed	Total Solids	Phosphates (P ₂ O ₅)	Silicates
22-2-34	12.0	7.55	0.003	0.022	Nil	Nil	0.215	30.6	0.001	0.88
8-3-34	12.0	8.45	0.003	0.040	"	"	0.283	31.9	0.001	0.88
22-3-34	12.0	10.50	0.002	0.031	"	"	0.292	33.2	0.001	0.90
11-4-34	12.0	10.50	trace	0.036	"	"	0.320	36.0	0.001	0.64
27-4-34	12.0	11.00	0.002	0.054	"	"	0.344	37.9	0.001	0.64
26-5-34	12.0	16.50	trace	0.073	"	"	0.518	45.8	0.002	0.64
21-6-34	14.0	24.50	0.003	0.128	"	"	0.704	67.8	trace	0.50
14-7-34	18.0	29.50	0.003	0.064	"	"	0.592	78.0	nil	0.56
8-8-34	26.0	28.40	0.002	0.080	"	"	0.400	78.8	0.002	0.56
22-8-34	32.0	24.42	0.002	0.088	"	"	0.708	117.6	0.004	0.56
6-9-34	24.0	20.60	0.002	0.080	"	"	0.500	80.0	0.002	0.26
19-9-34	22.0	18.40	0.003	0.080	"	"	0.338	72.6	0.004	0.50
25-10-34	22.0	12.07	trace	0.176	"	"	0.310	61.6	0.003	0.50
23-11-34	14.0	5.25	0.006	0.104	"	"	0.186	46.2	0.005	0.50
13-12-34	14.0	5.54	0.005	0.104	"	"	0.167	32.8	0.006	0.20
30-1-35	16.0	10.83	trace	0.060	"	"	0.214	47.2	0.002	0.16

STUDIES IN INDIAN PAINTING

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I

ANCIENT WALL PAINTING IN THE CAVE TEMPLES AT MĀMANDŪR

In 1923 Prof. Jouveau Dubreuil reported the discovery of traces of colour in the cave temples at Māmaṇḍūr,¹ which is situated 6 miles from Conjeevaram (12°51' N & 79° 43' E), the ancient Pallava capital. We owe these cave temples to the Pallava king, Mahendravarman I (590—620 A.D.) as is proved by an inscription.² It is probable that the paintings also belong to the same period. It may be pointed out that the architectural style and the richness of the colour are identical with those at Śittanāvāśal.³

Though the caves were once fully decorated with paintings there are only traces of paint now.

Experimental.

The subjects of these investigations were the carrier, the ground, the pigments and the binding medium.

Carrier.

From the traces of paint that are to be seen even to-day, it is evident that the ceilings, the inner walls and the pillars of the cave temples served as the mechanical foundations for the paintings. Their rough surface held the plaster fast.

1. Jouveau Dubreuil, Pallava Painting, Indian Antiquary LII (1923), p. 45.

C. Minakshi, Administration and Social Life under the Pallavas (Madras University Historical Series, 1938), p. 289.

2. T. N. Ramachandran, The Royal Artist, Mahendravarman I, Reprinted from Journ. Ori. Res., p. 11.

3. Jouveau Dubreuil, *Loc. Cit.*



Some of the well preserved portions of the paintings



Damage to paintings through sharp instruments

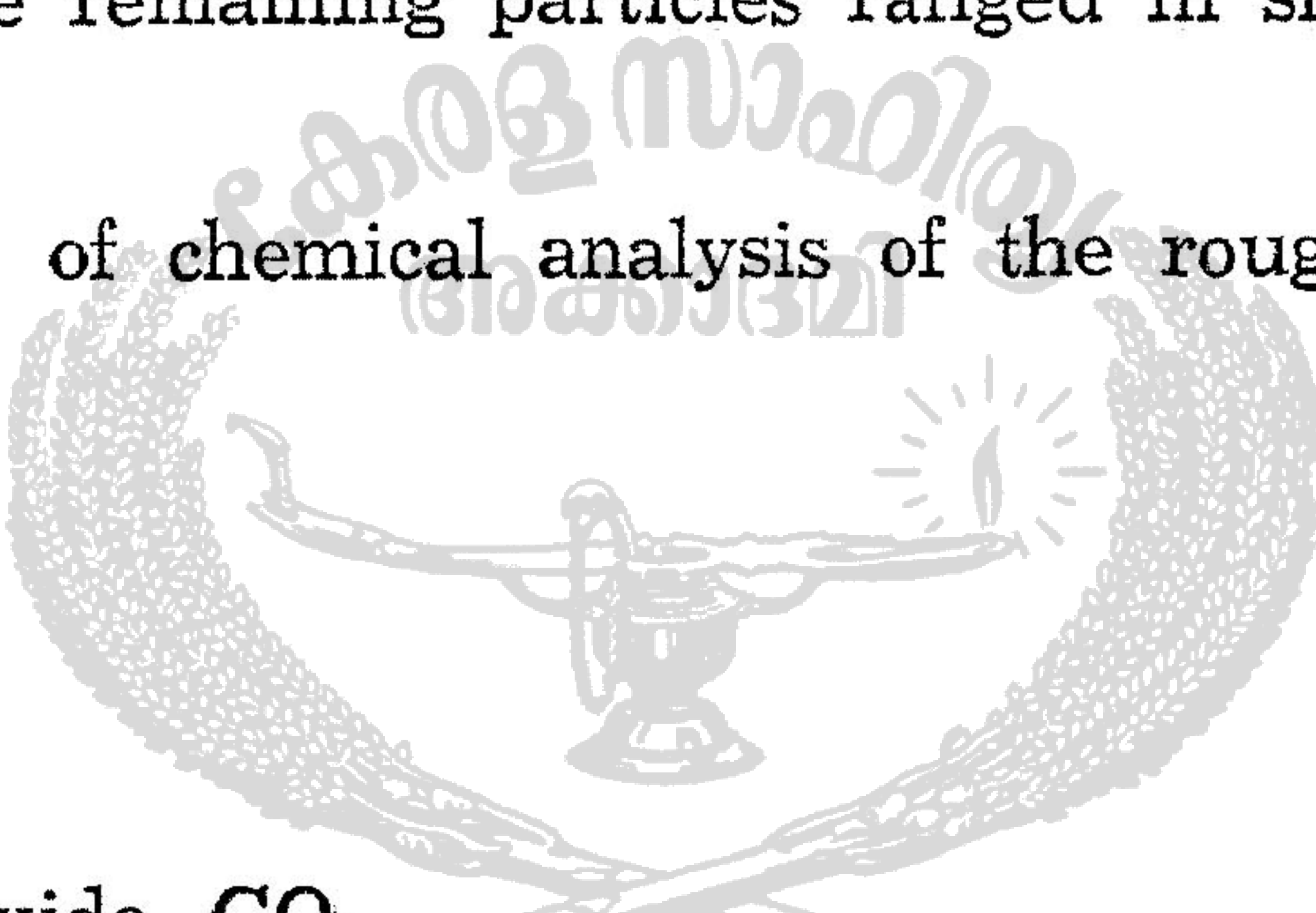
Ground.

Microsections of the painted stuccoes showed two lines of cleavage separating three layers, namely, the rough plaster, the fine plaster and the paint film. The layers of fine plaster and the paint film could be separated from each other by a sharp pin. But no such separation could be effected between the fine plaster and the rough plaster. Thus the binding between the fine plaster and the rough plaster is strong.

The rough plaster varies in thickness from 5.7 m.m. to 11.8 m.m. depending upon the inequality of the surface on which it has been applied. The thicknesses of the fine plaster and the paint film are 0.5 m.m. and 0.3 m.m. respectively.

On mechanically separating the particles composing the rough plaster and grading them according to size,⁴ it was found that nearly a fourth of them was less than 200 μ and another fourth was greater than 700 μ . The remaining particles ranged in size between 200 μ and 700 μ .

The results of chemical analysis of the rough plaster are as follows:—



	Chemical Analysis (Per cent)
Moisture	.. 0.61
Carbon dioxide, CO ₂	.. 7.95
Combined water and Organic matter	.. 8.56
Silica, SiO ₂	.. 53.21
Iron and Alumina, Fe ₂ O ₃ +Al ₂ O ₃	.. 4.51
Lime, CaO	.. 19.69
Sulphuric Anhydride, SO ₃	.. 0.19
Magnesia, MgO.	.. 0.92
Undetermined (mostly alkalies)	.. 1.56

The rough plaster is composed of lime and sand. There is ~~no~~ other inert material⁵ except sand, which has been specially added to serve as such. A pure rich lime having no hydraulic properties has been used and this shows that proper care has been taken in the preparation of lime for painting work. No organic binding

4. G. W. Robinson, *Soils: Their Origin, Constitution and Classification* (Murby), 1932, pp. 12-13.

5. *Proc. Ind. Acad. Sci., A*, 1938, 7, pp. 286-87.

material like gum or glue has been added and the consolidation of the rough plaster has been brought about by lime.

The fine plaster consists merely of a lime wash.⁶ From the strong binding between the rough plaster and the fine plaster, it is clear that the latter was applied while the former was still wet.

Pigments.

The following pigments have been identified⁷:—

Lime

Yellow ochre

Red ochre.

Terre verte.

Binding Medium.

There was no water soluble binding medium nor drying oil, glue, albumin, or casein in the paint.⁸ The technique was one of lime medium.⁹

II

ANCIENT WALL PAINTINGS IN THE JAIN TEMPLE AT TIRUPARUTTİKUNRAM.

Tiruparuttikunram is situated about 2 miles from Conjeevaram on the right bank of the river Vegavatī. It formed part of Conjeevaram from very ancient times. The temple is of interest both architecturally and on account of the paintings.¹

The ceilings of the front hall of the Vardhamāna temple at Tiruparuttikunram bear a series of coloured paintings which illustrate the life story of some of the Jain saints. The temple was built in the 14th century A.D. and the paintings probably belong to the late 14th century A.D. or the early 15th.² The paintings belong to

6. Proc. Ind. Acad. Sci., A, 1939, 10, p. 80.

7. Martin de Wild, *The Scientific Examination of Pictures* (London, G. Bell & Sons, Ltd.), 1929.

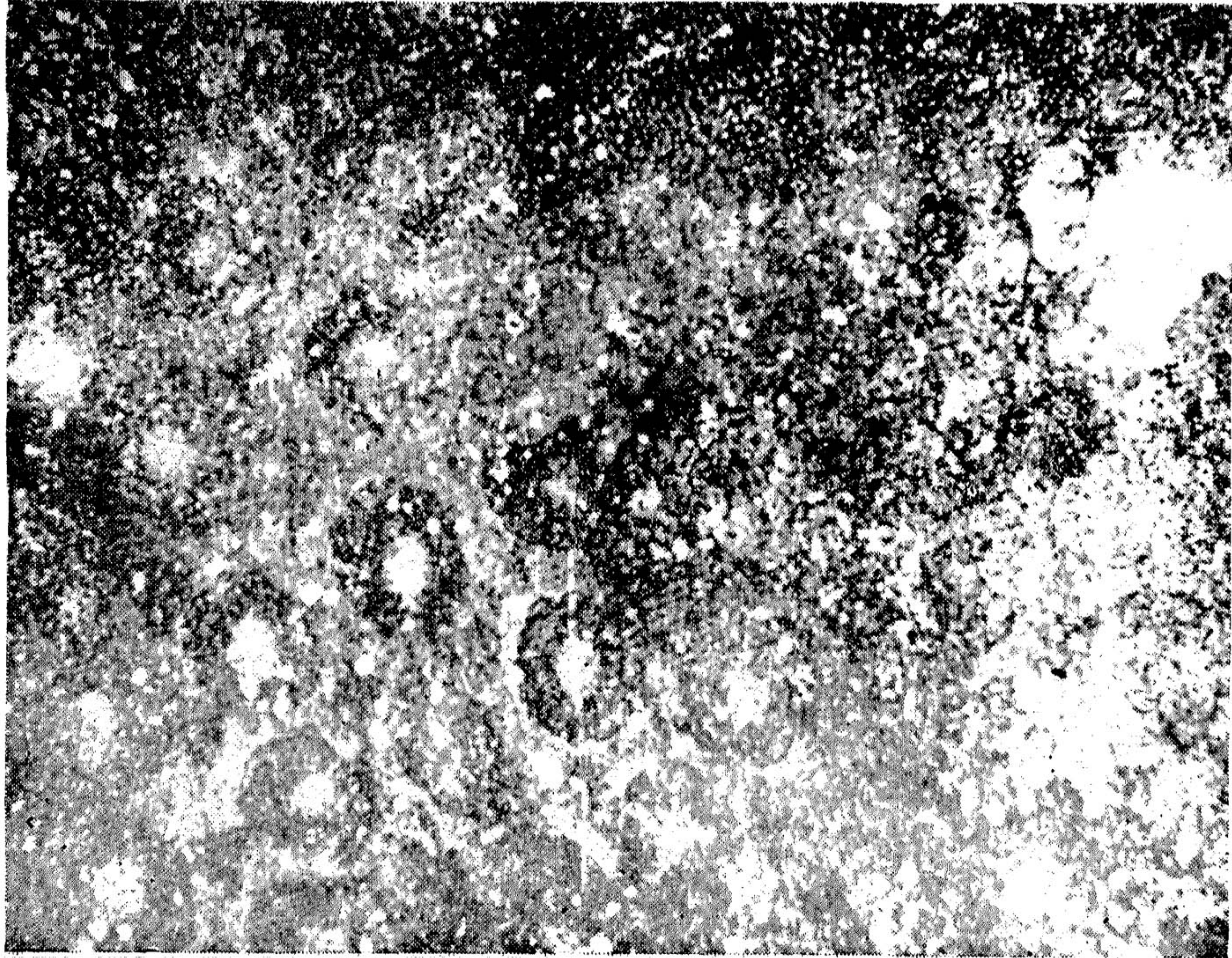
Technical Studies, 1935-36, 5, pp. 230-31.

8. Technical Studies, 1935-36, 4, pp. 135-44.

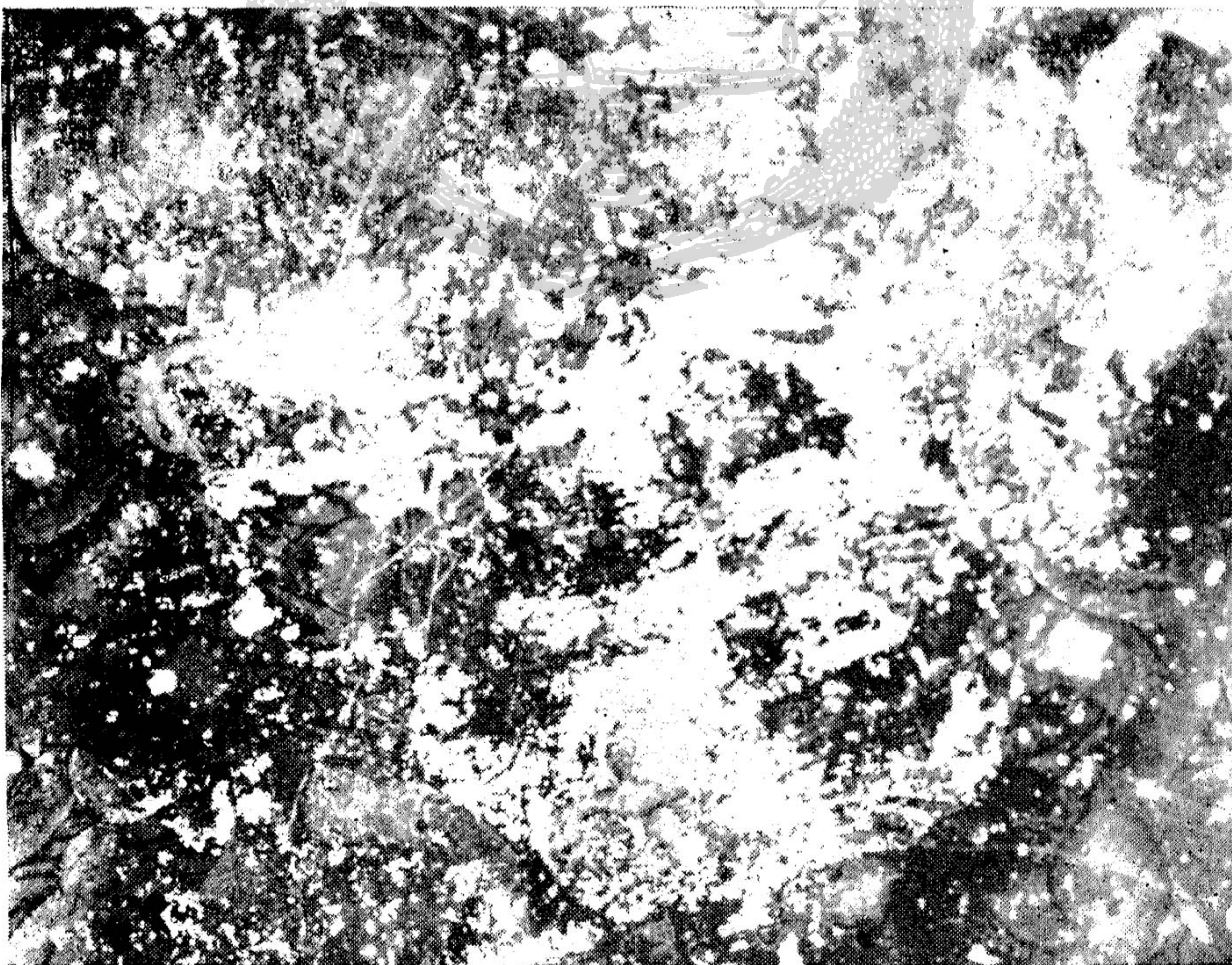
9. Proc. Ind. Acad. Sci., A, 1939, 10, p. 83.

1. T. N. Ramachandran, *Tiruparuttikunram and its Temple* (Madras Government Museum Bulletin), 1934, pp. 63-164.

2. T. N. Ramachandran, *Loc. Cit.*, p. 29.



* Represents the layers of insect wax on the paintings



Damage to paintings through the peeling off of the painted layer

a type of folk art which was so common during the Vijayanagar times.

The chemical investigations on the paintings were limited to the carrier, the ground, the pigments and the binding medium.

Carrier

The paintings are to be found only on the ceilings which serve as the mechanical foundations for them. The ceilings are constructed of large slabs of hornblende-gneiss joined together by plaster. Their rough surface has held the plaster fast. Not a little of the damage to the paintings has been caused by the rain water percolating through the interstices between the slabs of stone, and soaking into the plaster ground.

Ground

Microsections of the painted stuccoes showed two lines of cleavage separating three layers, namely the rough plaster, the fine plaster and the paint film. The three layers can be separated from one another by means of a pin. Thus there is no proper binding between the adjacent layers.

The rough plaster varies in thickness from 2 m.m. to 5.2 m.m. depending upon the nature of the surface on which it has been applied. The fine plaster and the paint film are each 0.3 m.m. thick.

The particles composing the rough plaster were mechanically separated and graded according to size. It was found that half of them was less than 200μ and the remaining half varied in size from 200μ to 700μ .

The results of chemical analysis of the rough plaster are as follows:—

	Chemical Analysis (Per cent)
Moisture	.. 0.84
Carbon dioxide, CO_2	.. 7.09
Combined water and Organic matter	.. 3.38
Silica, SiO_2	.. 71.47
Iron and Alumina, $\text{Fe}_2\text{O}_3 + \text{Al}_2\text{O}_3$.. 0.83
Lime, CaO .	.. 14.53
Sulphuric Anhydride, SO_3	.. 0.11
Magnesia, MgO	.. 0.26
Undetermined (mostly alkalies)	.. 1.49

The rough plaster is composed of lime and sand, the latter predominating. There is no other inert material except sand. A pure rich lime without any hydraulic property has been used. This indicates that proper care has been taken in its preparation.³ No organic binding material like gum or glue has been added⁴ and the consolidation of the rough plaster has been brought about by lime.

The fine plaster is only a lime wash.⁴ From the lack of binding between the rough plaster and the fine plaster, it seems that the latter was applied after the former had set.

Pigments.

The following pigments were identified⁵:—

Lime

Yellow ochre

Red ochre

Carbon

Indigo.

Binding Medium.

The paints had no water soluble binding medium, nor was there any drying oil, glue, albumin or a casein.⁶ The technique was one of lime medium.⁷ In the case of the black, however, gum has been added. From the lack of firm binding between the fine plaster and the paint film it is clear that the paint was not mixed with sufficient quantity of lime medium.⁸

III

PRESERVATION OF SITTANNAVĀSAL FRESCOES.

During the last few years, the problem of conserving ancient wall paintings has received some attention in India. Through the efforts of Sir John Marshall, formerly Director General of Archaeo-

3. May Doerner, *The Materials of the Artist and their Use in Painting* (New York, Harcourt, Brace & Co.), 1934, p. 269.

4. *Technical Studies*, 1935-36, 4, pp. 135-44.

5. *Proc. Ind. Acad. Sc.*, 1939, X, p. 80.

6. Martin De Wild, *The Scientific Examination of Pictures*, (London, G. Bell & Sons, Ltd.), 1929.

Technical Studies, 1936-37, 4, pp. 224-28.

7. *Technical Studies*, 1936-37, 4, pp. 135-44.

8. *Proc. Ind. Acad. Sci.*, 1939, X, p. 83.

logy in India, the H. E. H. Nizam's Government secured the services of two Italian experts, Signor L. Cecconi and Count Orsini, for cleaning and preserving the famous wall paintings at Ajanta¹ and Ellora.² But no such work seems to have been done for other ancient paintings in India. Recently, however, on the recommendation of the Government of India and the Director General of Archaeology in India, the author was invited by the Pudukkottai Darbar to preserve the wall paintings at Śittannavāsāl, which form the only group of Jain paintings in India of the 7th century A.D. executed on the Ajanta style.

It is needless to point out that the cleaning and preservation of ancient wall paintings without altering their original character, is a very delicate work and depends upon a detailed chemical study of the artist's methods and materials. For example, the method of cleaning and preserving a tempera painting differs from that adopted for fresco work. Careful use of water is permitted for cleaning some of the frescoes. But the use of water will completely destroy a tempera work. Further, if a wax preservative coating is applied to a fresco, it will give the appearance of tempera work. Where the two processes or variations of them are adopted in a group of paintings at the same site or even in different places in the same panel—which is not unusual—the problem of cleaning and preserving paintings becomes complex.

Thus the work of conserving ancient wall paintings is conditioned by exact knowledge regarding the chemical technique of the process adopted by the artist, the nature of the surface and the causes of deterioration through ages. Any attempt at conservation without such knowledge will result in considerable damage to the paintings.

So far as the author is aware, there is no publication giving details of the investigation on this subject with particular reference to known paintings. An attempt is made here to fill this gap so that it might serve as a guide for future work at other important sites. It might be pointed out here that the work of cleaning and preserving Śittannavāsāl paintings has been preceded by an investigation on the artist's methods and materials.³

1. Annual Report of the Hyderabad Archaeological Survey, 1920-21 and 21-24.

2. Annual Report of the Hyderabad Archaeological Survey, 1932-33.

3. S. Paramasivam, *The Mural Paintings in the Cave Temple at Sittannavasāl—An Investigation into the Method, Technical Studies*, 1939, VIII, pp. 82-89.

(2) *Problems of Conservation.*

The main problems in cleaning and preserving these paintings are as follows: —

- (a) Removal of all the causes which have led to the deterioration of the paintings.
- (b) Cleaning of the paintings.
- (c) Fixing the plaster and the painted layer.
- (d) Application of a suitable preservative coating.

The problems have been set down in the above order for purposes of convenience. It does not necessarily follow that this is the order in which the work was actually handled. For example, in certain cases, it was found necessary to clean the paintings prior to fixing. In other cases, this process had to be reversed even in different portions of one and the same panel. Thus the order to be followed depends on the condition of the paintings or portions thereof.

(3) *Causes of Deterioration.*

The causes that are responsible for the deterioration of these paintings are partly external and partly internal. In other words, the damages to paintings have been brought about by external or outside agencies and secondly by the defective methods of workmanship adopted by the artists.

External Causes.

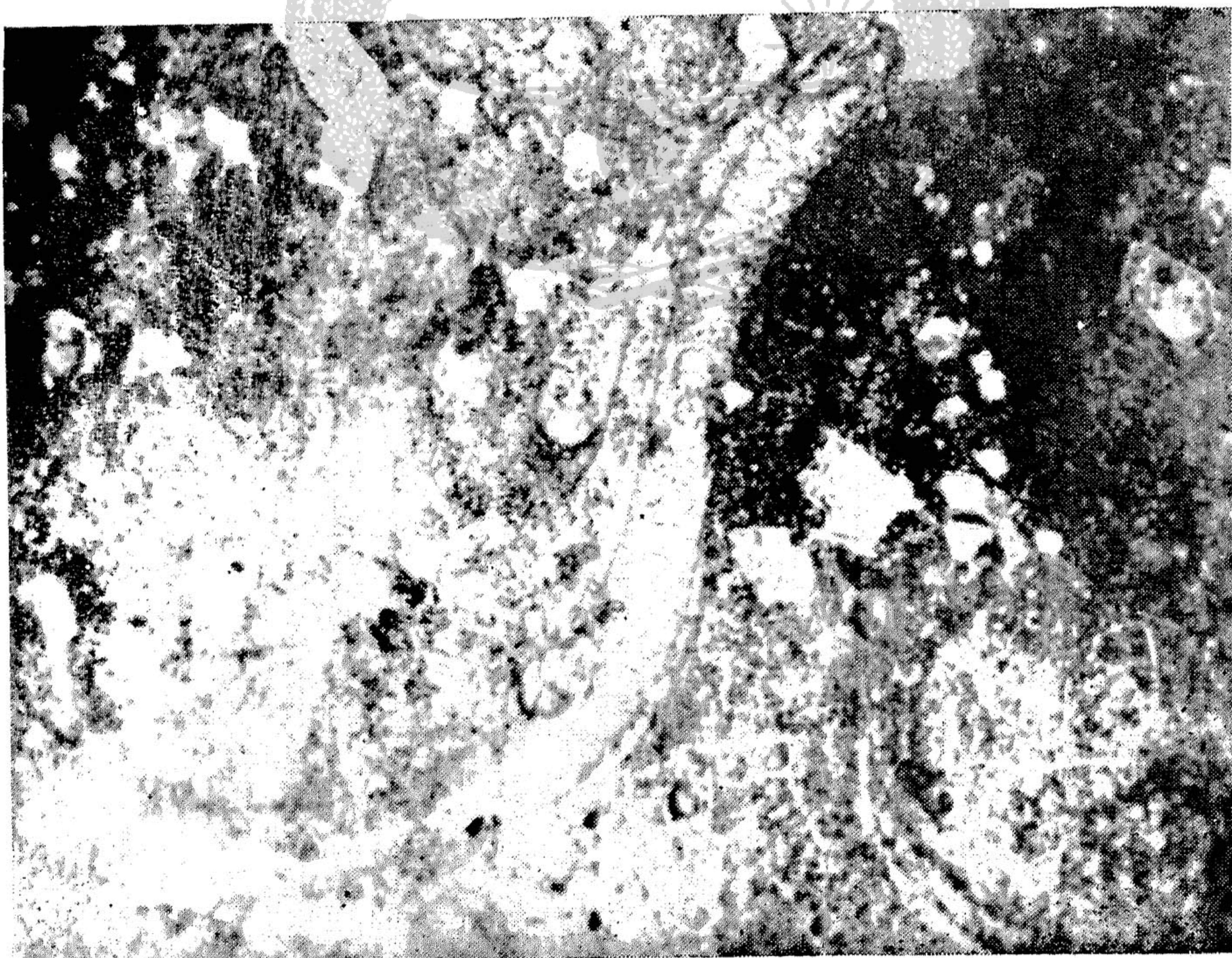
The external causes for the deterioration of the paintings partly depend on the particular construction and situation of the cave temple housing the paintings and partly on causes extraneous to them.

The principal cause for the deterioration of many wall paintings is poor or insufficient ventilation as at Ajanta, Ellore and the Br̥hadīśvara temple at Tanjore or excess of them as at Śittan̥navāśal. The outer verandah at Śittan̥navāśal which contains all the valuable paintings is exposed to the sun, rain and winds laden with moisture or dust.

There was a thick layer of algal growth cemented to the surface and completely covering all the details of artistic workmanship. This was due to the effect of moisture and sunlight on the paintings. In many places the pigment and the plaster layers have fallen off. In summer and during the hottest part of the day, the warm, dry air comes in contact with the paintings and withdraws from them



Damage to paintings through peeling off of the painted layer



Right hand portion represents black algal growth on the paintings
Left hand portion represents details of the paintings rendered visible by the removal of algal growth

some of the hygroscopic moisture necessary for the paintings and this causes capricious changes in the size of the particles composing the plaster. This is partly responsible for the peeling of the layer of pigment and the plaster.

A more serious source of trouble is a damp wall. Many of the paintings are exposed to rain. With a damp wall, the moisture escapes through the paintings and thereby causes damage to the paintings, as at Śittañṇavāśal.

Since the paintings are exposed to the winds, the latter have invariably carried dust and deposited it on the paintings.

The causes of decay external to the construction and situation of the cave temple are partly due to human agencies and partly to agencies other than human. The inner shrine at Śittañṇavāśal with its ceilings covered with paintings, is dark and dingy, but the verandah which contains most of the paintings is very well lighted. The dingy atmosphere of the inner shrine breeds insects, cockroaches, bats etc. They have left their remains on the paintings. Further there are unmistakable evidences of wasp nests and insect cocoons. Some of the insects have left their wax on the surface of the paintings. Thus the main problem, so far as the insects are concerned, is to eliminate them from the cavities and the hollow behind the plaster. The enlargement of the mouths of the holes or cavities on the walls and ceilings due to the insects going in and coming out, the enlargement of the cavities themselves and the consequent weakening of the painted plaster, the presence of wasp nests and insect cocoons over the paintings are some of the causes responsible for the damage done to the paintings.

By far the most serious damage to the paintings has been caused by human agencies, thus:—

- (a) Scratching and scribbling with sharp instruments.
- (b) Inscribing of the census number by census authorities on the paintings.
- (c) Use of smoky fires in the caves by the wayfarers.
- (d) Inscribing of charcoal marks and figures.
- (e) Inscribing with lime marks.
- (f) Smearing the surface with oil.
- (g) Use of tracing paper, gum and glue by artists in tracing the paintings, which have been left sticking to the surface.

The use of smoky fires in the past has given rise to a deposit of oil and soot on the paintings, the former attracting dust and dirt,

which have covered all the details of the paintings and darkened them.

Internal or Technical causes for deterioration.

The technical defects in the artistic workmanship have resulted in the scaling of the pigment layer and the layer of plaster. Where it has peeled off in tiny spots, the impression is one of general fading of the pigment. In some places there is no good binding between the stone wall of the cave and the rough plaster with the result that the latter tends easily to fall off. In spite of this, the stucco is held in position by the stronger binding in other places. In a few places, the fine plaster has separated from the rough plaster and the layer of pigment has separated from the fine plaster. This indicates defective workmanship in that the fine plaster was applied over the rough plaster after the latter had dried and that the pigment was applied with insufficient or with carbonated lime medium.

The tendency to scale off is more pronounced on the ceilings of the inner shrine. There is an outer layer of painting over the inner layer. The binding between the two stuccoes is weak so that a gentle tapping brings down the upper layer of paintings. This indicates that the second layer of rough plaster was applied after the earlier smooth painted layer had dried.

Another defect is the smoothness of the fine plaster, probably through polishing. Such smooth surface has a disadvantage. The pigment layer holds faster to a rough surface rather than to a smooth one.

(4) *Cleaning of the paintings.*

It has been explained elsewhere that the technique adopted at Śittanṇavāśal is one of fresco-secco. In this respect, the technique is entirely different from the one adopted at Ajanta, which has been conserved for us by the Italian experts. The Śittanṇavāśal plaster is firmer and better consolidated than the Ajanta one. These facts give us some clues as to the mode of approach to the problem of conserving the paintings.

The causes for the damage to the paintings which can be easily removed are as follows:—

(i) wasp nests, (ii) insect cocoons, (iii) insect wax, (iv) dirt and dust, (v) organic deposits including oil which always attract dirt and dust, (vi) soot (vii) charcoal marks, (viii) tar marks, (ix) lime marks, (x) tracing paper, gum and glue, (xi) algal growth,

(xii) tendency of the pigment layer and the layer of stucco to fall off.

Wasp nests.

When in thick layers they were partly detached by tapping them with the finger or a piece of wood or even a blunt needle. Where the painted surface was firm, soft fibre brushes were used, while care was taken not to drive the mud into the crevices between the plaster and the painted layer.

In cases where the mud persisted, it was carefully washed with a mixture of petrol and benzene (in equal volumes) or with 90% alcohol applied with a brush. In cases where it still held fast, damp sponge (not wringing wet) was tried. This was done slowly and cautiously using minimum of water and frequently rinsing the sponge and changing the water. In the absence of these precautions, there might be some staining of the surface. Where it still persisted, soap solution was used.

The petrol mixture was effective where there was the presence of organic matter.

Insect cocoons.

These were generally removed in a dry condition with the fingers or with the help of a needle. In certain cases, it was necessary to soften them with water before removing. At times, soap solution was more effective. Wherever the cocoons struck fast to the surface due to the presence of organic matter, a mixture of petrol and benzene was more effective. These liquids were applied with a cotton swab.

Wax.

This was removed by gently scraping it with a hot blade. Where it persisted, a mixture of toluene and xylene followed by an independent treatment of turpentine or xylene was helpful. The wax was removed with a cotton swab which was dipped in one of the liquids and rubbed lightly over the surface till it brought away in solution a little of the wax each time.

Dirt, dust and soot.

For removing the dust, a pair of bellows was first tried followed by the application of water with a soft brush. Wherever these methods were ineffective, a mixture of petrol and benzene or 90% alcohol was used.

Heavy insoluble accumulations of dirt were removed with a mixture of a thin solution of soap and ethyl acetate in equal volumes and diluted with twice their volume of water. The solution was applied to the surface by means of a cotton swab or a soft brush and then washed with water after an interval of about half an hour. In obstinate cases, the surface was covered with this mixture several times and the surface cleaned with hot water.

Organic deposits.

Deposits and stains of an organic nature (grease, oil, resin etc., which always attract dust and dirt) were removed, with petrol-benzene mixture applied with a cotton swab, care being taken not to drive the liquid into the pores behind the paint film or the plaster. Chloroform, acetone and ether were separately used in obstinate cases.

In some places, a black sticky deposit of animal excreta was present which did not respond to the petrol-benzene mixture. A dilute solution of ammonium hydroxide (1:4 and then 1:3) used was very effective.

Charcoal marks.

A 5% solution of sodium carbonate in water, ethyl acetate-soap solution mixture and ammonium hydroxide were effective.

Tar marks.

Acetone and ether were effective.

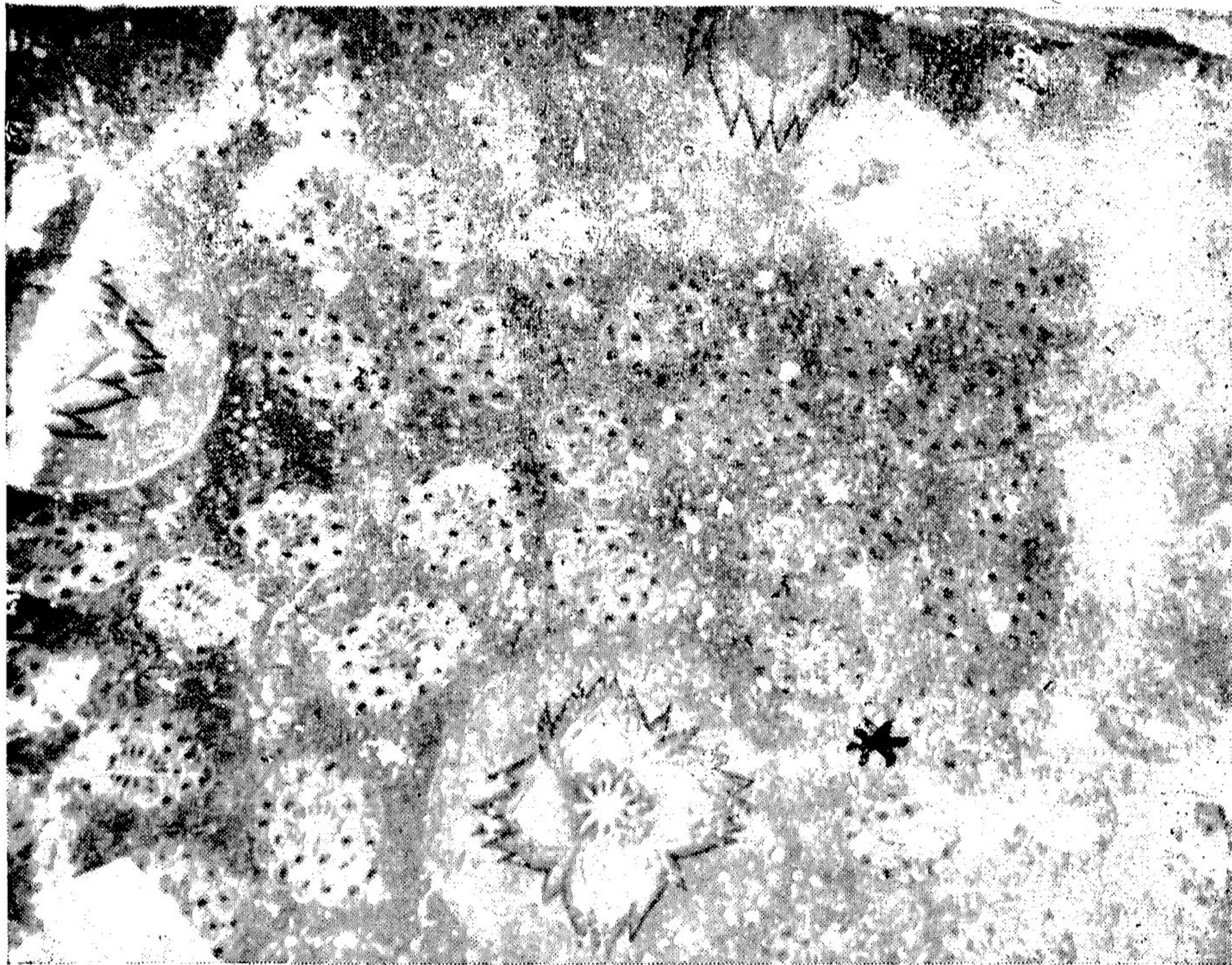
Lime marks.

Wet lime has been used for making these marks. Through carbonation the lime has become cemented to the surface. The painted surface was well washed with water and a cotton swab dipped in dilute acetic acid (1:4) was rubbed over it and then the surface was washed with water, when it was found that the lime marks had disappeared.

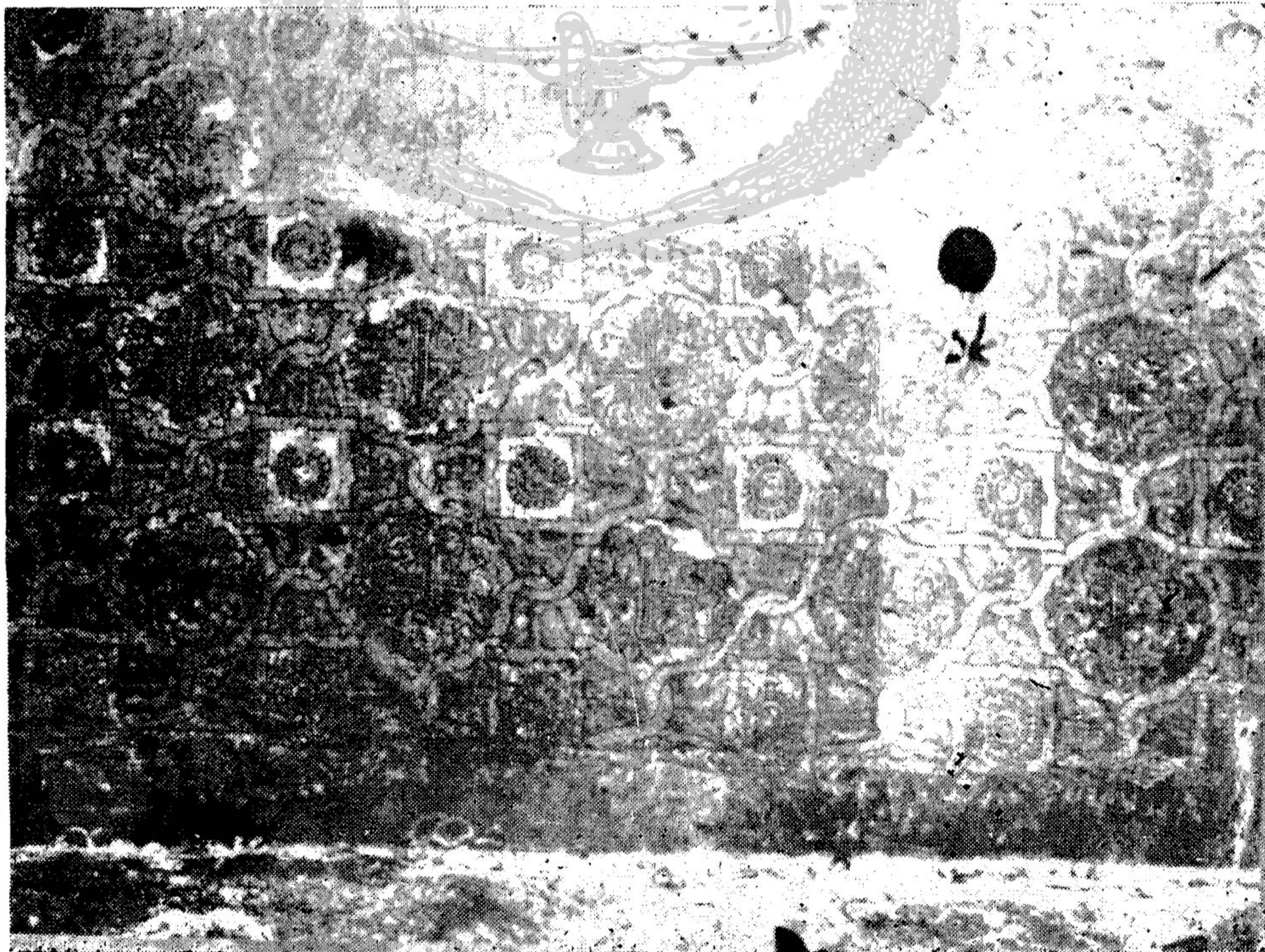
Tracing paper, gum and glue.

These were removed by repeatedly wetting the areas with hot water.

* Recently the front hall of the cave temple at Tirumayam was covered so thickly with oil, soot, dust and dirt that there was no sign of any paintings. They were, however, removed with soap and solution-ethyl acetate mixture and the paintings were uncovered.



Treated and untreated portions of the paintings
 * Represents untreated portion



Treated and untreated portions of the paintings
 * Represents untreated portion

Algal growth.

For the removal of the algal growth, the following special preparations were made:—

(a) Powdered pumice stone (Very fine and soft without gritty particles)	1 part by weight
Chalk	2 „ „
Dried sodium carbonate	1 „ „

These were made into a paste with equal volumes of water and glycerine and rubbed over the surface with a piece of wet cotton.

(ii) Soap	4 parts by weight
Chalk	4 „ „
Sodium bicarbonate	1 „ „
Calcium Sulphate	2 „ „
Water	50 „ „

The mixture was boiled for 15 minutes, rubbed over the painted surface and left for about half an hour. The surface was then brushed with a soft brush, cleaned with hot water and the process repeated till the surface brightened. Of these two recipes, the first was more effective.*

*In a private communication to the author, Mr. Rutherford J. Gettens of the Fogg Art Museum of the Harvard University to whom a sample of the plaster was sent writes as follows:—

“I agree with you that the black substance covering the painted layer is organic in origin. I observed under the microscope that there are a lot of mold mycelia, and it is probable that the whole discolouration is caused by mold or by mildew or by algae as you say. In our experience we have found that the mold and the mildew are the most difficult things to remove from any kind of surface; you cannot bleach it, and it is difficult to remove it mechanically. I think you have adopted the right method. A mechanical method with the help of some alkaline substance is probably the best Some years ago they had trouble with the formation of mildew on paintings in the Administration Building at the Panama Canal Zone. The surface was cleaned with a mixture of alcohol and ammonia. Although this did not prevent the mildew from recurring in a few years, the method is said to have cleaned the surface very well at the time. I used this mixture on one of your samples and it did remove some of the black but not all of it. You have, as I said, a difficult problem and one to which no one, as yet, found an adequate solution.

(5) *Fixing the plaster and the paint film.*

It was the usual practice in the past to employ some sort of cement for fixing the plaster and the paint film. But all cements take a very long time to dry. In the process of drying they expand in the direction of least resistance and carry with them harmful elements in their composition. In the case of the paintings, the direction of least resistance is naturally the direction towards the paintings. In the absence of proper care and control of the process of setting, the painted layer invariably disintegrated.

Some of the special cements that have been used are the following:—

(i) Lime-casein. This is a good cement except that casein is a palatable and nourishing food for insects. It cannot be used without the admixture of some poison like arsenic to keep out the insects. But the proportion of lime and casein and their consistency have to be carefully worked out, which is not easy.

(ii) Paraffin wax. This might be usefully employed in a cooler climate. At Śittanāvāśal the temperature in the shade goes up to about 110°F in summer and some of the panels are directly exposed to sunlight, and hence its use was out of question.

(iii) In recent years vinyl acetate⁴ dissolved in some suitable organic solvent has come very much into use as a fixative. It has been used in fixing the painted layers of Chinese paintings in the Royal Ontario Museum of Archaeology in Toronto. It is the most perfect fixative so far known and can be used with any type of painting. When it is applied to painted surface, it polymeises and forms a transparent film which protects the surface from dust and soot.

For fixing the plaster, the vinyl acetate solution of suitable consistency was injected behind the plaster by means of a hypodermic syringe. For fixing the loose painted film, the solution was applied to the surface with a soft brush.

The solutions generally used are 5%, 10%, and 20% solution of vinyl acetate in the following solvents,

4. T. P. Gladstone Shaw, The Properties of some polyvinyl resins as lacquer resins—Official digest of the Federation of Paint and Varnish Production Clubs.—Canada, January, 1937.

(i)	Toluene	70 %
	Xylol	20 %
	Pine oil	10 %
(ii)	Benzol	60 %
	Toluene	15 %
	Xylene	15 %
	Pine oil	5 %
	V. M. P. Naphtha	5 %
(iii)	90 % alcohol.	

For use with hypodermic syringe, a 5% solution was used. For brushing, 10% and 20% solutions were the best.

(6) *Toning.*

The paintings appeared faded through ageing and the application of vinyl acetate imparted a proper tone to the paintings.

In conclusion, the author desires to express his thanks to the Pudukkottai Darbar for providing him with all facilities for this work; to Mr. J. F. Blakiston, formerly Director General of Archaeology in India, and to Rao Bahadur K. N. Dikshit, Director General of Archaeology in India for suggesting his deputation for preserving the paintings, to Sir Alexander Tottenham, C.I.E., Administrator of the Pudukkottai State and to Dr. F. H. Gravely, Superintendent of the Madras Government Museum, for their great interest in this work.

DR. SAMUEL BROWN

PHYSICIAN AND PROPRIETOR OF MADRAS
IN THE 17TH CENTURY

By

D. V. S. REDDY, M.B.B.S.,
Vizagapatam.

Dr. Samuel Brown was a prominent person in the early days of Fort St. George. He was popular and famous as a physician and surgeon in Madras and its environs. But his friendly dealings with the Moors and his attempts to become a Zamindar were viewed with suspicion by his superiors and employers. His guilt in the accidental poisoning of Mr. Wheeler and his duel with Dr. Blackwell made him still more notorious. But he somehow managed to survive all his scandals and sorrows. He soon regained and enhanced his prestige and practice by his personality, his multifarious activities and his remarkable cures. When he was discharged from the Company's service at Madras, he had an extensive practice. This circumstance, combined with his other interests in Madras prompted him to settle down as a private practitioner in the growing city rejecting the offer of the Company to send him out as a Medical Officer to Bengal. He died in Madras and his tomb stone can still be seen in St. Mary's Church in the Fort.

The surname Brown occurs fairly commonly in the records of the Fort St. George in the 17th Century. Even in the single decade in which Dr. Brown lived in Madras, there were at least 8 persons with this name differentiated, however, by their Christian names. About the year, 1690, there were living in Madras a John Brown, a free-man inhabitant of the place, a William Brown, a soldier, and a Leonard Brown. John Brown seems to have secured a job in the gun-room in 1693, in 1696 and again in 1698. Richard Brown who was at Vizagapatam in 1687 was at Madras for some years and died there sometime before October 1696. George Brown was a soldier and was discharged in 1695 for his drunkenness. Robert Brown the 4th mate of a Ship is mentioned in the records of 1696. More surprising than these names is the fact that there were in Madras at the same time two

persons having the same name, *viz.*, Samuel Brown. According to a letter, dated 25th January 1688, from London to Fort St. George, a certain Samuel Brown was entertained as a writer and sent to Madras. In the records of 1697, one of the free-men inhabitants of the town is mentioned as Samuel Brown. Again in the records of 1698 it is noted that the Assay Master promised to instruct Mr. Samuel Brown and make him qualified for the employment. Lastly, there was the hero of this sketch, Dr. Samuel Brown (Browne).

BROWN'S CAREER AS A MADRAS SURGEON.

Dr. Brown was first appointed as surgeon to the Fort by the Council of Fort St. George. On the death of Dr. Heathfield on 31—3—1688, the Council was compelled to appoint locally a successor to Heathfield, pending a nomination by the home authorities. An entry dated 7—4—1688 reads: "Dr. Heathfield being deceased and Dr. John Plumer gone home upon *Royall James*, and the hospital being in great want of an able Chirurgeon, Dr. Samuel Brown, late Chirurgen of *The Dragon*, being reputed so, and desirous of the employ, it is ordered that he be entertained at the same salary and allowances as his predecessor—Dr. Heathfield had."

From the extracts now available, it would appear that Heathfield had 36 pounds per annum as salary, 5 pagodas per mensem for diet money and 50 fanams per mensem for keeping a horse. He also had allowances given for the maintenance of assistants and servants.

Dr. Samuel Hart who was appointed as another surgeon in the course of the year 1688, continued as a colleague and assistant of Dr. Brown. In due course, the Company sent out Dr. Bulkley who arrived in 1692. Thereupon the Council of Fort St. George passed the following orders on 29—12—1692.

"Ordered that Dr. Bulkley Chirurgeon do enter upon his charge of hospital and take care of the patients therein and look after all the medicines and other things carefully that none be spoiled or wasted negligently or used for any other end or purpose but those they were intended for. And that he keep an account of all the material actions in a book that may remain in the Hospital to be examined when needful or required..... "Dr. Brown is to be continued a Chirurgin here as before..... And in refund of the supply of Chirurgeons from England there is not room for the continuance of Dr. Hart. He is to be discharged for employment."

Five years elapsed before the Company discovered that Fort St. George was maintaining two surgeons. They immediately ordered a reduction. Dr. Brown was discharged at the end of 1697. The list showing the names of Company's servants at Fort St. George at the end of September 1697 includes the names of Bulkley and Brown as Surgeons. A consultation dated 3rd January 1698 records that new allowances were permitted to Dr. Bulkley. The same adds "and Dr. Brown is discharged from service and allowances from the last day of November last." This action was probably taken in pursuance of the Company's letter by Ship '*Tavastock*.' A list of employees at Fort St. George in 1688 contains only Bulkley's name as surgeon. The Company, however, held out a ray of hope "As for Brown, if it please God our surgeon of the Fort or Bay or elsewhere should die or be moved, we are willing Mr. Browne should have first preference to such a vacancy." Brown was then offered a job. He declined it, as evident from the following extract dated 13th January 1698.

"In pursuance of the Rt. Honble: Comps: orders in (the) 56 paragraph of their Generall Letter by (the Tavestocke) Dr. Brown having been Discharged from their service in this Garrison and an (...) made him of being a Chirurgeon of Chuta (nutte) ffactory in Bengall, Hee doth excuse himself from goeing for the present by reason of his engagement in practise here."

By the time another vacancy occurred and was offered in 1705, Brown was long dead. Brown died about the end of 1698, at Madras.

* * * * *

THE TRIAL OF BROWN IN A CASE OF POISON.

The most unfortunate accident in Dr. Brown's practice is summarized as followed by Col. Lowe (Vol. I, p. 565):—

"Mr. James Wheeler, one of the members of the Council, took a dose of Brown's Physic on the 30th August 1693, before starting on his morning walk. He did not appear at the Council meeting held in the forenoon and word was brought that he had been seized with serious illness. Another message followed at 11 a.m. reporting his death. The Council at once adjourned and set out for Wheeler's house. On the way, a letter was put into the President's hands. A flash of recollection had revealed to Dr. Brown that the medicines administered in the morning had been inadvertently pounded by a servant in a mortar used for Arsenic. Immeasurably distressed, Dr. Brown hurriedly penned a note to the President saying 'I have

murthered Mr. Wheeler by giving him Arsenic. Please to execute justice on me the malefactor as I deserve.' Dr. Bulkley held an autopsy and reported that, though little could be gleaned from appearances, the symptoms before death pointed to poison. Browne and his servants were committed into custody. The former was tried and acquitted by Grand Jury who broght in the bill Ignoramus."

THE EXACT DETAILS AS GIVEN IN THE CONSULTATIONS
FROM DAY TO DAY.

WEDNESDAY, 30TH AUGUST 1693

Word being brought us while at Consultation on Ye: 28th: Inst: that M. Wheeler was very sick, and soon after about 11 a clock that he was dead, wee went forthwith to his house and appointed Mr. Mildmay & Mr. Vanden Anker to take accot: of ye: Rt: HonbleP Companyes Books and papers, wch: were in Mr. Wheelers hands, but in ye way thither ye following note was delivered into ye hand of ye President Vizt.

I have Murthered M. Wheeler, by giveing him Arsnick, Please to executed Justice on me the malifactor as I deserve.

SAMUELL BROWNE.

* * * * *

Whereupon Doctor Browne after examination and his particular relation of the circumstances of a fatall mistake was by warrant of ye Judge of Advocate committed as allso his servant who negligently powdered Pearl in a stone Morter wherein arsnick had been before beaten, the mixture whereof with the Pearle is supposed to be the occasion of his Death, and there being symptoms of Poyson Doctor Buckley (Sick) ye: Chyrurgeon of the Hospital was ordered to open the Crops and make his report.

* * * * *

DR. BUCKLEY'S REPORT CONCERNING MR. WHEELER.

May it Please your Honr. with the Worspll: Councill.

According to your orders I did on Munday ye 28th: instant in ye afternoon open ye dead Body of Mr. James Wheeler about five hours after his death, and upon veiwing ye: Viscera or Bowells, found them not much altered from their naturall temper and Colour the parts that seemed to suffer most were ye stomach and gutts wch: were a little inflamed and almost wholly bared and strip't of the mucous or slimy covering wth: which those parts are commonly invested, ye Lungs allsoe were a little inflamed ye:

blood that I gathered of severall vessels all appeared blacker then usuall, But ye suddainness of his death, and the severe symptoms he laboured under before he dyed, were greater arguments of Poyson received then anything I could trace out by Dissection, this from.

Srs

Yor Honrs & cas most humble and obedient Servt,

EDWD BULKLEY.

Fort St. George ye 30th August 1693.

* * * * *

Dr. Brown himself submitted the following account of the incident and asked to be excused.

Honble Sir,

After I came from the Camp Mr. Wheeler did several times desire Physick of me, but because his Lady was much against it, and his Occasions not very great, I as much as I could without displeasing him, declined the gaveing it, but about the Latter end of August he was very Urgent and came to my house for Physick, but I being abroad at that time as soon as I Came home and being told of his being there and gon

(Ten pages in original missing here in Madras record office).

* * * * *

(The ten pages of matter missing in Madras Record Office is as follows (obtained from India Office transcript)

I waited on him to know his pleasure, he told me, he designed to take a Vomitt without his wifes knowledge, but since it happened that she was present, it was all one, for he was opprest with a great heaviness in his stomach, sower belchings, and want of appetite, but he was mostly concern'd because that whatever he eat seemed to have little or no relish which he said had never happen'd to him all the time of his being in India before, for these reasons, and his being troubled with a hiing (sic) to vomitt, I consented to give him one which I did on Fryday the 25th August about 7 in the morning, twas four graines of Emetick Tartar, "tworkt in a quarter of an hour which he said was much sooner then such Physick used to do with him, but had done its opperation as we thought by nine the same morning; so desired me to go home, he went upstairs to sleep, but that night

when I came to see him he told me he had some motions with his Physick after I went away, but by 11 a Clock that forenoon its operation was quite over, he added that one night at Judge Dolben Chamber Mr. Afflack sent for some white Powder and gave him a Paper of it which he said did his stomach good for its sowerness and that it seemed to be Pearl or some such thing bidding me send him some like it, and the same bitter Drink which he had often taken before with success; on Sunday 27th August I took two cakes and a half of Pearl and when twas ground I put in a paper and sent it with a bottle of bitter Drink to Mr. Wheeler by my servant, this was at about 2 in the afternoon, and he being asleep his servant put it up till he wakt, on Monday morning about 5 a Clock he took a small wine Glass of the bitter Drink, and as much of the Powder of Pearl as would lye on a Rupee; but about 2 hours after he found himself ill, and began to Vomitt, so sent for me when I came I was surprized to see him vomitting with a Bason full of the yellow stuff before him, he told me he had vomitted twice as much of the same Humour and that twas very bitter for the most part yett sometimes some sower trace would come up to, he added that he beleived the Bitter Drink to strong, upon which: I drank a Glass of double the quantities of wt: he took, and would have taken the Pearl to but he would not tell me where twas, but his vomitting continuing I conclud'd the Pearl had been ground in the same mortar not washed where some days before I had had Arsnick beaten for Peter Toris Cancer and therefore immediately sent for Mr. Bulkley and Communicated my thoughts to him so we concluded to give him Oyle Olive to hinder further Corrosion and salt of Tartar in broth to sheath the Poynts of the Arsnick while we were getting his ready some of his servants which heard wt: I said to Mr. Bulkley were whispering Poyson, which as soon as Mr. Wheeler heard he was struck with; so much terror that he fainted away allmost, but coming to himself a little he cryed Death had seized one of his leggs and soon after expired, I think twas then past 10 a Clock but cannot justly tell beleiving that the Pearl being beat in the Arsnick mortar did so distract me I could not rightly consider of anything and in the midst of that fitt of grief writt that note to your Honour; desireing not to survive my Friend whose sudden Death I then though my fatall carelessness had procured but afterwards examining the matter twas by Doctor Bulkleys Prentice the Hospitall Coolleys, my own servants, that the white stone Morter in which the Arsnick was beat was not at my House all that day in which the Pearl was ground for Mr. Wheeler which did a little compose my mynd

so that I enquired of Mr. Bulkley who opened the deceased how he found his Viscera who told me that neither his stomach nor gutts were Corroded, and much about the same time the French Padre Frai Michael came to me and told that a Woman of a very healthy constitution dyed the same day Mr. Wheeler did of vomitting she was taken ill at 10 in the morning and dyed the same day about noon without takeing any sort of Physick, this report being confirmed by many evedences who alsoe instanced two more who dyed about the same time yet; is to say a day or two after, these things put together when my distraction was a little over made me consider yet; Mr. Wheeler complained of little or no paine, when I first came and no drought all along, so that twas possible he might dye a sudden death, and his Physick not procure it, which yesterday I was thoroughly convinct of by giving $\frac{3}{4}$ of the remaining Powder of Pearl (which Mr. Wheeler tooke some off) to a little dogg which though it was about 3 times so much as Mr. Wheeler took yet it had no opperation on the Dogg who is now alive and well; but indeed tho this experiment together with that on myself with ye: bitter Drink and the foregoing circumstances has quite cleared all my scruples yett it leaves so lively a sence of the Almighty correcting my Follies by this lamentable accident that I shall for the future assiduously labour for Gods Blessing on my sincere endeavours to be more diligent and cautious in my Business as to the other and ys: world.

Honble Sr: Your obedient humble servant,
SAMUELL BROWNE.

* * * * *

The ultimate outcome of the trial is thus reported to the Hon'ble Company by Governor Higginson:

As soon as Mr. Wheeler dyed Dr. Brown wrote a note to the President that he murthered Mr. Wheeler by giving him Arsenick whereupon he was examined and upon his own confession brought to a tryall but discharged by the grand jury so that the particular circumstances were not examined in court but upon the best inquiry that we have made since and upon the report of those who saw Mr. Wheeler's body opened we do not find any reason to contradict any point of the Doctor's narrative or to suspect that he had any design to do Mr. Wheeler any mischief between whom there was an intimate friendship.

Fort St. George,
4th Sept. 1693.

NETHLL. HIGGINSON.

* * * * *

DR. BROWN FIGHTS A DUEL AND IS COMMITTED TO CUSTODY

Leut: Seaton acquainting us he heard of a quarrell between Dr. Browne and Dr. Blackwall, upon wch: Dr. Browne was gone to a garden wth: a sword, he is ordered to take a guard and bring them both to us, and he returning presently with him reports that he found Dr: Blackwall at his house, and Dr. Browne returning from the Garden, upon examining them they agreed yt: there were words of quarrell between them at Dr: Blackwalls House, but that Dr: Blackwall did not goe from his House. Dr: Browne appeareing to have drunke to much and not capable of an examination It is ordered that he be committed to ye: Custody of ye: Guard in ye: Fort, and that tomorrow morning the Mayor doe examine the parties and witnesses and that if it shall appear that one or both did give or receive a challenge, that the Person so offending be committed to ye: Custody of the Marshall till next Consultation day.

This was in November 1695, and the doctor seems to have been quiet for sometime after this incident. But his nature and temperament and his activities were such that he could not avoid getting into troubles frequently. In April 1696, he was again committed into the custody of the Marshall.

"Complaint having been made by Madrantala in a letter to the Governour received last night that Doctor Brown had gone to the house of Ananta Terterra his Junkanneer or Ipere and carried him away by force, and robbed him to the value of six thousand Pags: as by a List sent Doctor Brown being sent for gives this accot: that on Saturday having rid out to Yegmore in Company, in their returne by the Ipere Choultrey the moors Peons called him names, and he rideing up to them to demand the reason there followed more aggravating words and beat him, when he came home being informed where the Chief man of the Choukey lived, he tooke his sword and Pistoll and being followed by his boy with another Pistoll and his House-keeper went to the house and by force took out Ananta Terterra and brought him to the Bridge gate, where understanding that that was not the man which had abused him, let him goe.

Ananta Terterra doeth allso further complain that Doctor Brown broke his face wth: a Pistoll pulled his beard &ca: and was robbed to the value of six thousand Pags: which tho there is noe Reason to believe, yet the Duans Officers will take occasion to make a demand as accustomary and give us trouble by complaining to ye: Nabob and Dr. Brown being apparently guilty of a breach of the Peace, It is resolved that he be committed to the Custody of the Marshall that others may be deterred from the like, and that the Inhabitants may understand that such practices are not allowed."

Dr. Brown was in custody for one week. This must have given him time for self examination and remarks. On 4th May,

the Council of Fort St. George considered the case "Doctor Brown having Petitioned for his liberty and allso severall Patients, in consideration of their suffering for want of his assistance, It is resolved that he be discharged from his confinement giving security to the Judges satisfaction."

Brown's generous nature sometimes led him into difficulties. There is at least one instance where his intervention helped a Frenchman. In the middle of 1693, Pedro Pares, a Frenchman of the Fort Garrison, ran away to the camp of the Moors. Dr. Brown who was then there brought him to Madras. The truant hesitated to come in till the pardon was assured. Dr. Brown gave the Council and Governor an assurance of the good intentions of the man to serve the Company faithfully for the future. After this, pardon was granted. In one instance, where Brown stood security, he had more trouble. In July 1697, the Council made the following entry "Mr. Charden and Dr. Brown being sent for and demanded of them to produce Mr. Masson for whose appearance they had given bond the 15th May 1696, in one thousand pags, but they both answered they knew not where he is where-upon the bond being produced and the penalty demanded, Mr. Chardin declared he was ordered by Mr. Masson not to pay it except compelled; and Dr. Brown doth declare that when he signed the bond, Mr. Chardin did assure him that he had sufficient effects of Mr. Massons in his hands to save them harmless." It was ordered that the Bond be put in suit in the Court of Admiralty against Mr. Chardin.

* * * * *

DR. BROWN AS A DIPLOMAT.

Brown's personal relations with some of the Mohammadan princes and leaders gave him a unique position. A letter from Johannes Potuliat (Physician to Prince Arram Tarra) to Governor Higginson says "Dr. Brown hath given me understand that your Honour hath a request to his princely court, doeing this be arrand all shall be consented to.." Another letter from the same physician to the Governor about a week later adds "I lately advised your honour (by Dr. Brown's wife) of the Prince's order." Another instance of his capacity to negotiate with the Mahommadans around Madras is mentioned in the records of 1693. We read that the *Junkanner* had sent a message to Dr. Brown and that he was ordered to ride out that way and tell him the Governor would hear no proposals till the goods were delivered. Dr. Brown reported that upon

his delivering the answer the *Junkanner* ordered the delivery of the goods to him to bring with him but one Bensee, his Gento Conacopalle advised the *Junkanner* to stay. Next day 16th, Dr. Brown brought with him 21 bundles of cloth accompanied with 3 of the *Junknners* servants.

BROWN AS HAVILDAR.

Dr. Brown was in the camp of Cassim Khan in the first half of 1693. A *parvana* from Cassim Khan to the Captain of the English and dated 27-7-1693 states "Dr. Samuel Brown has all this while been at my camp and has wrought many good cures here—lately I have given him leave to go to Madras...." The return of Dr. Brown from the Moor's camp is again alluded to, in a consultation dated 7th August 1693. "Dr. Browne coming lately from the camp where he has been detained sometime by Cassim Khan...."

On his return from the Moor's camp in July 1693, Browne brought the news that Cassim Khan was appointed Nawab of the country. The New Nawab granted a Parwana to Dr. Browne, for the renting of 6 towns adjacent to Madras. A letter from Goldsborough to Governor Higginson says: "I would not think fit for Dr. Browne to be the Rt. Hon'ble Company servant whilst he becomes Havildar of any towns." The Council also considered that it was not expedient for Dr. Browne to enter upon the Towns, because the rent payable is not mentioned and the old Nawab Zulpheker Cahn was still in possession of the Government. Translation of Parvana referred to, in the consultation dated 7th August 1693 reads:—

All Desmook Deponde Chief inhabitants.....belonging to Golconda Country, be it known to all people the towns that are mentioned in this writing, I have lett out to rent to the English Doctor Samuel Brown. You all must understand that he is now your head renter all the revenues that formerly belonged to the Duan (Dewan) you are all to see and make it good to Dr. Brown's servants according to list and act according to Sallabad and you are to obey all such orders as he shall give you that are reasonable. Dr. Brown's duty is this that he see and give content to all his inhabitants under him and duly see to increase the revenues of the towns under him. You must all be sure to act according to this Parvana dated.....

List of the names of the towns.

Trivetore,
Santungaud
Saudium Cuppam.

Ernavosur,
Cuttuwacaw,
Aleunda Cherre.

Brown seems to have continued on good terms with the Moors. Potuliat wrote in December 1693 to Higginson. "Please to send me two chritiall glasses for a lantern of good work, such as Dr. Brown had sent him." Brown was also deputed to cure the wounds of Nabab's Officers. An Officer who had been dangerously wounded in Cassim Cawn's Country fighting with the Poligars coming to Town sent his brother to the President desiring that a doctor may cure his wounds. The President ordered the peons to find them a convenient place for their lodging and sent Doctor Browne to cure his wounds. The officer was to bear his own charges.

BROWN'S WORK AS A MEDICAL MAN.

He was in charge of a hospital. The commodious Hospital building by the side of the church was converted into quarters for factors. The temporary hospital was located in James street in the house of Pois. The new hospital by the riverside was completed about 1690. It was built on a site at the north end of the barracks. The cost of the new building amounted to Pagodas 2,500. The vestry spent the greater part of the money it received by the sale of the old hospital. Yale, who was then the chief at Madras, himself advanced a further sum of Pagodas 1700. The hospital is said to have been a handsome edifice built like a barracks in the Tuscan style. The scope of the hospital and the financial responsibilities are indicated in the following passage in a consultation dated 8th December 1698 :

"Resolved for the future they (the Vestry the church wardens and ministers) are discharged from contributing thereto and only to pay the charge of such sick persons as they shall send hither." The Council offered to bear all the charges of the Hospital and directed that thereafter the Chirurgeon or Steward of the Hospital, render a monthly account to the Paymaster of the charge of the said Hospital.

The records contain a number of bills presented by Brown, as contingent expenditure for "bazar medicines."

(1) 2nd August 1695 :—

Ordered that the Paymaster do pay Pags. 11, 7, 26; to Doctor Brown being for drugs brought by him from the Bazar for 8 months as per his account now delivered.

(2) 16th December 1695 :—

Paymaster producing an account of drugs brought by Dr. Brown in the Bazar for 6 months ending the ultimo November last amounting to pag. 12, 7, 45; it is ordered to

(3) 31st August 1696 :—

Dr. Brown presenting a bill amounting to Pags. 19, 22, 48 for drugs brought in the bazar and for 8 months ending July last. The Paymaster was ordered to pay the same.

(4) 14th June 1697 :—

Paymaster was ordered to pay Dr. Brown's bill of ditto (drugs brought in the bazar for use of the Hospital) from 1st August 1696 to 30th April 1697 amounting to pags. 18, 4, 4. This bill provoked the Council to make anew rule that, "for the future, the doctors do produce their bills monthly."

(5) 16th February 1698 :—

Ordered that pags. 10, 7, 58 be paid to Dr. Brown being for drugs bought by him in Bazar for 7 months ending November last. This bill leads us to infer that the rule about monthly bills was not observed by Brown. This bill covers the last few months of Brown's service as Surgeon of the Fort Hospital.

ADDITIONAL DUTIES AND WORKS ENTRUSTED TO DR. BROWN.

1. Brown examined along with Dr. Buckley, Mr. Nicks who was under confinement and signed the joint certificate, about the delicate health of the prisoner and recommended release for the sake of health.

2. An entry dated 31st July 1693 states: "Ordered that the warehouse keeper do deliver to Dr. Brown two maunds of salt petre and four maunds of copperice to make Aqua Fortis for the use of the Assaymaster." So, the Scalpel had to be laid aside now and then to take a flask or test tube.

3. In February 1697, the Council asked Dr. Buckley and Brown to view the chest of Medicines for Fort St. David and West Coast, in the presence of Warehousekeeper who is to take care that they take nothing out of it. So, the Inspectors were to be watched!

4. The Council ordered Dr. Buckley and Brown to view and report on a parcel of "Gallingal" brought from China.

A report was sent that the material was good.

BROWN'S FAMILY.

We have no means of knowing when Brown was married. Col. Crawford writes that Browne married Ann Baker in 1688.

An entry in the year 1695 states that Dr. Brown was the recipient of a share in the butt of Sherry divided among the Company's married servants. His share amounted to 15 gallons. Brown's children are mentioned in a record of 1697. "Mr. Proby and his wife, Mrs. Brown and their children being still at the mount, the Governor permitted Dr. Brown to go this evening with Palankeens and Coolies to fetch them and ordered them to go by Junkanneers chief mett and acquaint them with his business to the mount but if they refused to let him pass, he was strictly ordered not to offer any violence but to return." An entry dated next day reads "This morning Dr. Brown came back from the mount with his wife and family and passed by the Junkanneer cheif mett without any molestation." Browne's daughter, Elizabeth, married Rev. Charles Long, Chaplain of Madras.

BROWN'S CONTRIBUTIONS TO SCIENCE.

The dictionary of National Biography states that Browne sent to England collections of dried plants which now form part of the herbarium of the British Museum. I humbly suggest to the University and to the post-graduate research students in Natural Sciences, to make detailed enquiries about Browne's collection and publish a monograph on the subject. As far as I know, Browne was the first medical man from Madras to take interest in the study and identification of plants. The planning and development of the garden for the cultivation of herbs and vegetable drugs as an adjunct to the hospital in the fort in the last decade of the 17th century, must have been partly responsible for this increasing interest of Browne in medical botany. That Browne was a man with intelligence, enthusiasm and also the curiosity of a born scientist is abundantly proved by the fact that he not only collected specimens but also sent them to England to enable other medical men and botanists, more learned than he, to study them and preserve them, for future study

BROWNE MANUSCRIPT OR DR. BROWNE'S JOURNAL.

Very few surgeons of the East India Company in the last quarter of the 17th century were in a better position than Dr. Browne to write his reminiscences or to leave a record of his work as a medical man. It is very unfortunate that there are at present no rerords of the hospital in the Fort where Dr. Browne worked for so many years. No detailed reports of cases treated by Dr. Browne in Madras, outside the hospital are available in contemporary writings, or official documents. Dr. Browne, however, has left a book of

case-notes. In the course of my search for the medical literature and medical manuscripts of the 17th century, I had a pleasant surprise, when I read of a manuscript in the British Museum and labelled as "Dr. Browne's Journal, Sloane Manuscript 1689". Dr. Shafat Ahmad Khan in his book "The Sources" supplied the information that the manuscript contains some details of a medical nature. The date of the journal is given as 1692. Dr. Browne was at that time at Madras and in charge of the hospital. After prolonged correspondence, I secured a photostat of some pages. The cost was very high. Subsequently, I succeeded in getting a typed copy of the portions of the journal, which contain notes of cases treated by Dr. Browne. The manuscript is therefore a rare one, being one of the few written in India in the 17th century, by medical men and giving details of the types of cases and modes of treatment common in Madras about the close of the 17th century. The copy in my possession occupies nearly 24 pages of closely typed matter and contains a number of archaic words, symbols and abbreviations which require a close study with the help of those versed in old English and the history of medicine. Dr. Browne may therefore be considered as also one of the earliest of the Company Surgeons to maintain records of the cases seen and treated by him at Madras. His journal is the earliest detailed clinical memoranda or report on the diseases of India in general and especially on the common diseases incident at Madras in the 17th century.

THE THEORY OF TWO KOPPERUNJINGAS

By

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Madras

In the last issue of this Journal (Vol. XII, July 1940, No. 2), Mr. Balasubrahmanyam, under the caption 'Kōpperuñjiṅga and the Villiyanūr Record,' asserts that there was only one chief of the name Kōpperuñjiṅga to whom all the records with the name Sakalabhuvanachakravartti Kōpperuñjiṅgadēva and with regnal years must be assigned. On the other hand, the evidence for postulating the rule of two chiefs with the name Kōpperuñjiṅgadēva is clear and definite.

The portion relevant for our evidence in the text of the Villiyanūr record which Mr. Balasubrahmanyam takes up for examination reads :—

In-nāyanār kōyil Tribhuvanavīradēvaṛkku muppattēlāvadu mudal Alagiyaśīyar Kōpperuñjiṅgadēvaṛkku paḍinonṛāvadu varai * * * * āṛāvadu Tai-mādattu Uḍaiyār Perumaṅgalam-uḍaiyār Uḍaiyapperumālāṇa Kāḍuvetṭigal kaṇakku kēṭṭu' i.e.,

In the month of Tai in the sixth year (of Kōpperuñjiṅgadēva), Uḍaiyapperumāl *alias* Kāḍuvetṭigal of Perumaṅgalam, having enquired into the accounts of the temple of this god (i.e., at Villiyanūr) from the thirty-seventh of Tribhuvanavīradēva till the eleventh of Alagiyaśīyar Kōpperuñjiṅgadēva.'

This inscription does not specify whether 37 and 11 are to be taken as years, but Mr. Balasubrahmanyam would take 37 alone as year and 11 as day. If one figure is taken as year the other also must be construed in the same way, according to the construction of the sentence in the text. If the 11th day was really meant, it would have been clearly indicated by some such word as *tiyaḍi* as in l. 8 of the same inscription. Thus Mr. Balasubrahmanyam's interpretation of the record suffers from two main defects :—

- (1) the auditing of accounts would be made from year to year, i.e., for whole years and not till a particular date

of a month. No such instance has so far been met with inscriptions ; and

- (2) the actual wording of the record does not warrant his interpretation either ; he has, therefore, to make an emendation in the text which is not called for.

In this connection it may be pointed out that the 11th year of Kōpperuñjiṅgadēva I corresponded with the initial year of Kōpperuñjiṅgadēva II who was co-regent with his father during the last six years of the latter's rule.

A definite and indisputable evidence to prove the rule of two Kōpperuñjiṅgas is furnished by a record from Chidambaram (A. R. No. 103 of 1934-35). This inscription, dated in the 19th year of Sakalabhuvanachakravarttin Kōpperuñjiṅgadēva, refers to a flower garden called 'Śokkachchīyaṅ-kamugu-tirunandavanam' formed at Bhūpālasundaranallūr situated in Veśālippāḍiparru. In the concluding portion, this inscription is directed to be engraved on the same wall¹ where the original gift of *this* garden was recorded in the 15th year of PERIYADĒVAR. Fortunately the very same 15th year record is found on the identical wall indicated above (A. R. No. 467 of 1902); it refers to the same garden called 'Śokkachchīyaṅ-kamugu-tirunandavanam'; its extent of 63 and odd *mā* of land is also reiterated, and what is more to our point, the record itself belongs to Sakalabhuvanachakravarttin Kōpperuñjiṅgadēva, who can be no other than PERIYADĒVAR² mentioned in the other record.

The most important facts gleaned from the present inscription are that the elder chief was also known as Kōpperuñjiṅgadēva, that he had the title Sakalabhuvanachakravarttin and that he had an independent rule of 16 years.³

1. North wall of the second prākāra of the Naṭarāja temple.

2. *Periyadēvar* is a term of reverence to indicate the chief or sovereign who ruled previously. Kulōttuṅga-Chōḷa III and Rājēndra-Chōḷa III refer respectively to Rājādhirājadēva II and Tribhuvanavīradēva as *Periyadēvar* (A.R. Nos. 490 of 1922 and 216 of 1908), while Kōpperuñjiṅgadēva refers to previous Chōḷa monarchs simply as Kulōttuṅga-Chōḷa and Tribhuvanavīradēva without any respectful qualifying epithets (A.R. Nos. 95 of 1900 and 186 of 1936-37).

3. While publishing the 'Śēndamaṅgalam Inscription of Maṇavāḷapperu-māl,' I assigned to this chief a rule of 11 years (*Ep. Ind.*, Vol. XXIV, p. 27), but now it has to be extended to 16.

This 'Śokkachchīyaṇ-kamugu-tirunandavanam' referred to above which is definitely known to have been formed in the 15th year of PERIYADĒVAR (Kōpperuñjiṅgadēva I) is again mentioned in a 3rd year record (A. R. No. 465 of 1902) of Sakalabhuvanachakravartin Kōpperuñjiṅgadēva who must be identified with Kōpperuñjiṅgadēva II.

A fortiori it may be stated that the *Periyadēvar* evidence supplied by the Chidambaram inscription⁴ is conclusive and that the rule of two Kōpperuñjiṅgas may hereafter be taken as well established. In the face of this single evidence it is unnecessary to consider the other minor arguments raised by Mr. Balasubrahmanyam.

Finally, I agree with him in his identification of Kūḍal with the Kūḍal of Kaṛkaṭamārāyaṇ, but this is different from the Kūḍal of Kōpperuñjiṅgadēva, because the Kūḍal of the latter was in Kīl Āmūr-nāḍu while that of the former was in Puramalai-nāḍu. The phrase Kūḍal Avaniālāppirandān Kōpperuñjiṅgadēva has to be interpreted as Avaniālāppirandān Kōpperuñjiṅgadēva of KŪDAL.



4. I owe the suggestion of the importance of this record to my friend Mr. A. S. Ramanatha Ayyar.



No. 1. Vimāna. Panaṅguḍi Agastīśvara temple

PANANGUDI AGASTĪŚVARA TEMPLE

A Cōla Temple—9th Century A.D.

By

S. R. BALASUBRAHMANYAN, M.A., L.T.,

AND

K. VENKATARANGA RAJU.

We propose to discuss in this paper, a temple of the 9th century A.D. which can be assigned to the period of Vijayālaya, the founder of the Cōla house of Tanjore. Most of the Pallava Temples have more or less been fully explored and dealt with in the publications of M. G. J. Dubreuil and in the memoirs of the Archaeological Survey. But the temples of the transition period from the age of the later Pallavas to the days of the imperial Cōlas are an unexplored field. We have identified a few temples belonging to this period of early Cōlas,* and the Agastīśvaram Uḍaiyar temple at Panaṅguḍi should be added to this list of early Cōla temples.

Panaṅguḍi is a small and obscure village in the Koḷattūr Taluk of the Pudukotah State. It is south of Śittannāvāśal (about 9 miles

* (a) *Vijayālaya's* (acc. Circa. 850 A.D.)

(1) Vijayālaya Cōlīśvaram—Nārttāmalai

(Journal of Oriental Research, Madras), Vol. VII, Part IV, pp. 351-358 and Vol. VIII, Parts II and III.

(2) Kāliyāpaṭṭi Cōlīśvaram :

(J.O.R.M., Vol. XII, Part I).

(3) Tiruppūr Cōlīśvaram :

(J.O.R.M., Vol. XII, Part IV, pp. 300-302).

(b) *Aditya's* (acc. 871 A.D.)

Kaṇṇanūr—Subrahmanya temple :

(J.O.R.M., Vol. XI, Parts III and IV, and Indian Historical Quarterly. XV).

Tirukkattalai—Sundareśvara temple :

(J.O.R.M., Vol. X, Part III, pp. 231-239)

(c) *Parāntaka's* (acc. 907 A.D.)

Urūmūr (Eṇṇambūr)—Kaḍambavaneśvarar.

(To be published in the Journal of Indian Society of Oriental Art, Calcutta).

N.W. of the capital), a place which is famous as a great centre of Jainism, wherein is found a remarkable rock-cut cave temple of the days of Mahēndravarmān Pallava in which unique fresco paintings of the 7th century A.D. have been discovered. The Śiva temple called Tiru-agastīśvara is situated on the southern bund of the tank of the village of Panaṅgudi.

The temple (Illus. No. 1) is a small, compact and beautiful edifice built completely of well-dressed and close-fitting granite blocks similar to the temples of Kāḷiyāpaṭṭi and Tiruppūr which we have already dealt with (J.O.R.M. XII Parts I and IV). It faces east.

The temple consists of a *Garbhagraha* 9 ft. square on plan externally and 5 ft. square internally and a closed *Ardhamandapa* provided with a small entrance in front. There is a *Mukhamandapa* 25 feet broad attached to the temple in front of the *Ardhamandapa* whose moulded basement is found imbedded below the surface of the ground.

There are also the basement of the *Nandimandapa* and traces of one of the sub-shrines round the central shrine.

The walls of the central shrine are adorned externally with a series of pilasters, each surmounted by *kalāśam*, *kumbham*, *padmam* and *palagai* all four-cornered and decorated with elegant scroll-work. The *corbels* above the pilasters are plain and angular in outline. Unlike the temples of Kāḷiyāpaṭṭi and Tiruppūr, there are niches for idols (*Koṣṭa*) in this edifice and they are crowned with double arched *makaratōraṇas*. But there are no idols in the niches at present. The *cornice* above the walls is thick and single arched and is provided with *Kūḍus* crowned with tri-foliated pieces of stone. All its corners are decorated with scroll-work. Below the cornice there runs a frieze of *Bhūtagaṇas* and above it a frieze of *Vyāḷa Vari*, and makara heads jut out in places where the frieze bends into angles.

The *grīva* is four-sided and is provided with four niches surmounted by *Kūḍus* and *Simhalalāṭams* one on each of the four cardinal points. There are Indra in the east, Dakṣiṇāmurti in the South, Viṣṇu in the West and Brahmā in the North. Each of the figures measures 1' 2" in height.

The *Śikhara* is four-sided and curved and is crowned by a four-sided stone finial (*stūpi*—crown broken) resting on two stone slabs of which the lower is ornamental at the edges and the upper



No. 2. Jyēṣṭha Devī

is drawn out into lotus petals. This Śikhara resembles those of Kāliyāpaṭṭi, Tīruppūr, Tirukaṭṭalai and Koḍumbālūr.

The whole of the exterior should have been covered with plaster and polished in stucco and traces of these are still visible in some places.

A few stone images—of Jyeṣṭhā Dēvī (Illus. No. 2), Vināyaka, a nāga, four bulls of the griva—are found on the ground, some half-buried.

It is usual in the early Cōla temples to include round the main shrine sub-shrines for the *Aṣṭa-Parivāra* Devas as recorded in an inscription of the Eṇṇambūr temple—Sūrya, the Sapta-mātrkas, Gaṇeśa, Subrahmaṇya, Jyeṣṭhā, Candra, Caṇḍikeśvara and Nandi. But the cult of the Sapta-mātrkas and Jyeṣṭhā Devī fell into disrepute in later times and these idols have almost disappeared from modern temples. Such of the early Cōla temples as remain untouched by renovators still retain these sub-shrines as at Tirukaṭṭalai. While in a few we find these sculptures lying loose in compounds of temples uncared for and without the benefit of worship. The queen of the Pāṇḍya King Jaṭila Parāntaka excavated a shrine for Durgā on the rock at Tirupparaṅkunṇam (Madura district) and she got sculptured an image of Jyeṣṭhā Devī as well. In an inscription of Rājēndra I at Eṇṇāyiram (South Arcot district—325 of 1917) we find mention of the shrines of Jyeṣṭhā Devī and the Sapta-mātrkas.

There are two published inscriptions belonging to this temple. One of them is an incomplete record containing only a part of the historical introduction of Kulōttuṅga III and the other of the 4th year of the Pāṇḍyan King Māraṇvarman Kulaśekara Dēva. But on closer inspection during our visit (on 8-6-1938) a new unpublished inscription was noticed on the north wall of the shrine. The text of the inscription (Illus. No. 3) is as follows :

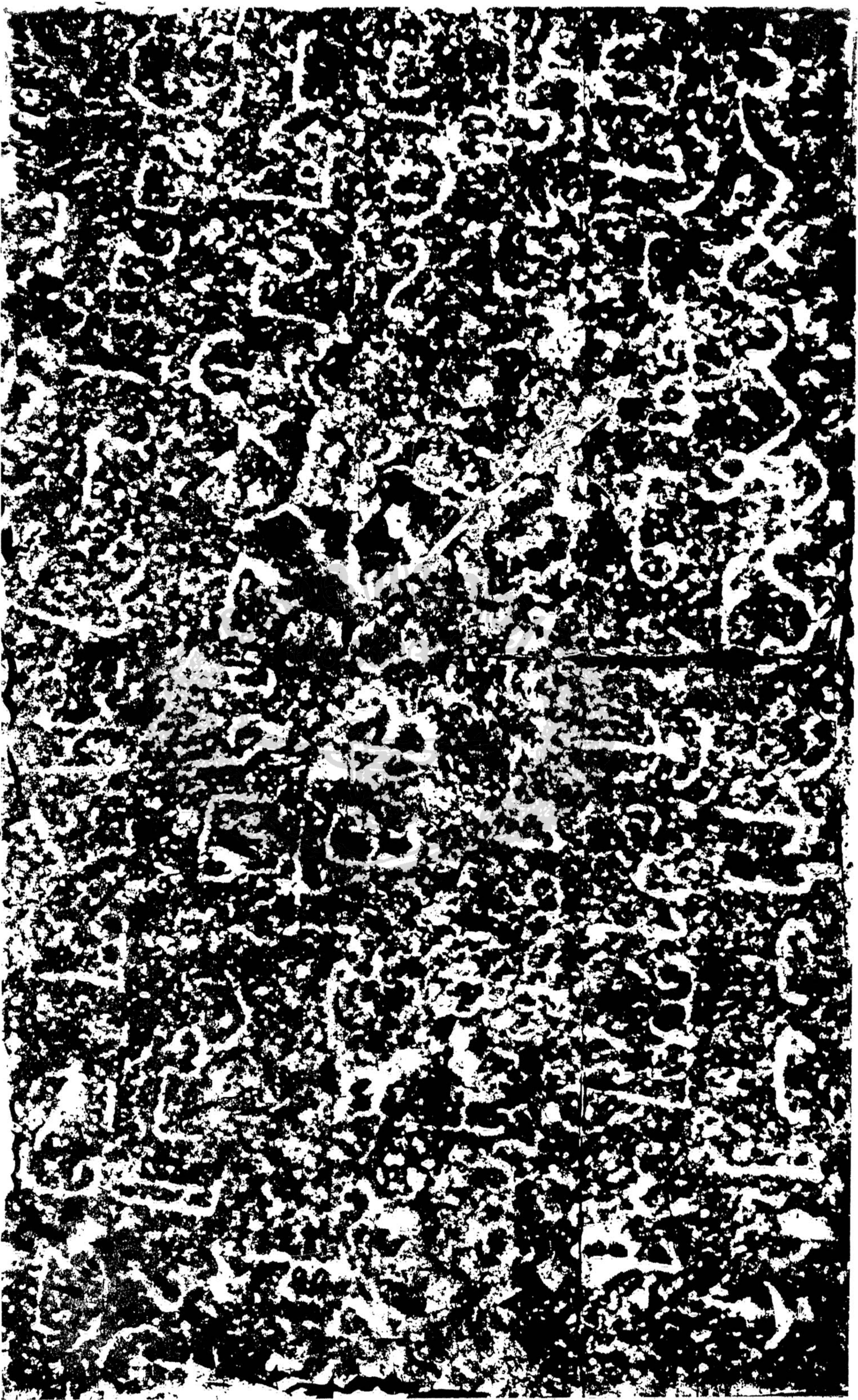
1. Śvasti Śri Kōpparake.....
2. Sari pammarki yāṇḍu 14
3. āvaḍu ivvāṇḍu Aṇṇal
4. Vāyil kūṇṇattu (Ūrōm ?)
5. Panaṅguḍi Paramesvaraṅku
6. ivvūr..... ,

Except the regnal year and the name of the monarch nothing can be gathered from this incomplete record. Still it is valuable, as it helps us to reinforce the other arguments to fix the age of

the monument. It relates to the 14th year of a certain Parakeśari-varman. On palaeographical grounds the inscription can be assigned to the 9th century A.D. or early 10th at the latest. The existence of the temple in that period is beyond dispute. But its architectural features resemble those of Tiruppūr and Kāliyāpaṭṭi, which we have assigned to the period of Vijayālaya and this temple also has to be assigned to the group of Early Cōla temples of the age of Vijayālaya Cōla (acc. Circa A.D. 850). As in the case of Kāliyāpaṭṭi and Tiruppūr (also of Viśalūr not yet published) the temple of Panaṅguḍi is built wholly of stone—and resembles the others in size and style of construction. The Stūpi and the Ardhamanḍapa are missing in the temple of Kāliyāpaṭṭi; only a portion of the Śikhara is found in the temple at Tiruppūr. But at Panaṅguḍi we have all the original features of the temple intact. But unlike Kāliyāpaṭṭi and Tiruppūr there are niches for idols on the walls of the Garbhagrha of Panaṅguḍi. Hence this temple of Panaṅguḍi is of great importance among the early Cōla temples.

Fortunately most of the temples in the State of Pudukotah still retain their pristine glory and therefore offer an attractive field of study for the antiquarian.





No. 3. Newly discovered inscription
14th year of Parakesaripannar

IS THE GĪTĀ A GOSPEL OF WAR ?

By

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The pacifist who believes in the teaching of the Gītā has to meet the charge which is often levelled against the Song of Kṛṣṇa, that it is an exhortation to violence, a gospel of war. The charge is neither new nor flippant. In the Parapakṣa of the Śivajñāna-siddhiār, Aruḷ Nandi argues that the Gītā is on a par with the Baudha works in that it is a book of guile, and says that when Arjuna refused to fight his own kinsmen, Kṛṣṇa who wanted that they should be killed used a specious argument by telling the Pāṇḍava hero that he, the Lord himself, was responsible for the killing and not Arjuna.¹ We shall first state the case for regarding the Gītā as a gospel of war, then examine the possible answers to the charge, and lastly make an attempt to interpret the Gītā-teaching consistently with the doctrine of ahimsā.

I

The case for regarding the Gītācārya as an advocate of war is based on the incidents of the Mahābhārata that culminated in the fratricidal battle and the words of counsel that he gave to the despondent Arjuna. The Gītā opens with a scene on the battle-field of Kurukṣetra at the commencement of the Great War. Arjuna desired to have a near view of his opponents. And so he requested his divine charioteer to lead his car and station it between the two armies. When this was done, Arjuna saw before him teachers, friends and kinsmen whom he had to kill. Though he had known already whom he had to meet in battle, he realised the ghastliness of this act of war only when he was face to face with his foes who were but his kinsmen and friends. Overcome with pity, he dropped his bow and refused to fight. This was a moral crisis of great magnitude. To fight or not to fight was the question. Upon this depended the fate of millions of lives.

1. The substance of Aruḷ Nandi's argument is given, and not a literal translation of the verse.

Instinctively Arjuna felt that to fight was wrong. He thought that it was better for him to be killed in war unarmed and unresisting than to kill his own kith and kin. True, Duryodhana and his compeers were in the wrong. They were evil-hearted men overpowered by greed. But to kill them was also wrong. And two wrongs would never make a right. If one had in mind the disastrous consequences of a war, one would not go to battle, whatever be the cause. Society would come to ruin with the destruction of its elders and youths; there would be lawlessness, confusion of orders, immorality and consequent degradation and degeneracy. And so was it not a sin to have resolved to go to war? What after all was the cause? The ostensible reason was the wickedness of Duryodhana. But was not the real reason 'Our greed for the pleasures of the kingdom.'?² Arguing in this way and overwhelmed by grief, Arjuna told Kṛṣṇa that he was not for the fight.

It is true that the Pāṇḍava hero was not motivated by any absolute standard of morality. He felt that he should not kill his kindred (svajana). If his foes had been strangers, perhaps he would have nonchalantly finished with them. But that does not make his resolution wrong. He was right in so far as he thought that it was immoral to kill one's own kinsmen. Kṛṣṇa, if he were the Lord of Peace, should have complimented Arjuna on his wise resolve and prevented the carnage and blood bath. But on the contrary, what he did was to chastise the hero for his meekness, and make him fight by appealing to his Āryan valour, by specious metaphysical arguments, and even by intimidation and threat.

Kṛṣṇa begins his discourse by rebuking Arjuna for his ignoble, disgraceful, and heaven-barring loathsome feeling. An Āryan fighter should never yield to weakness and faintness of heart. To him there is no higher good than a righteous war. A true Kṣatriya should be delighted when such an opportunity presents itself before him and should regard it as an open door to heaven. To run away from a war of this kind is not only cowardly and dishonourable but also sinful and immoral. Victory or defeat, Arjuna should fight. If he fell, he would go to heaven, if he won, he would rule the earth.³ Even on metaphysical grounds Arjuna need not be afraid of war. After all, who is the killer, and who is killed? Not the soul. For it is unborn, eternal, ever-lasting and ancient; it is not

2. *Gītā*, I, 45.

3. *Gītā*, II, 2, 3, 31-37.

slain when the body is slain. "He who thinks it slays, and he who thinks it is slain—neither of them knows it truly. It neither slays, nor is it slain." If Arjuna should think that the soul is subject to births and deaths, even then there is no room for sorrow. Whatever is born is sure to die, and whatever dies is sure to be born again. Why then should he grieve for what is inevitable?⁴

Kṛṣṇa's appeal to Kṣatriya valour cannot be justified by the codes of higher ethics. To fight in battle is bravery, no doubt. But to die unresisting requires more courage. And this was what Arjuna proposed to do. The metaphysical argument advanced by Kṛṣṇa is pointless. On the ground of the indestructibility of the soul any war can be justified and no act will appear to be unethical; for is not the soul non-active? Kṛṣṇa did not stop with mere arguments. He had recourse to intimidation and threat. He revealed to Arjuna his 'aweful' form with a thousand faces and myriad eyes. The devotee saw the sons of Dhṛtarāṣṭra together with the hosts of kings, Bhīṣma, Droṇa, Karna and the leading warriors, all rushing into the flaming mouths set with terrible fangs. He saw some of them caught between the teeth and their heads crushed to pieces.⁵ Kṛṣṇa's plan succeeded. Arjuna got unnerved and became completely docile. He was told that he was not the killer, for the work had been accomplished already by the Lord. Arjuna was to serve merely as an instrument (nimitta), an apparent cause.⁶ And at the close of his discourse, Kṛṣṇa informed the Warrior that all his resolve not to fight would be futile. "If indulging in self-conceit you think, 'I will not fight,' vain is your resolution. Nature will compel you."⁷ Subsequently, no doubt, he asked Arjuna to consider the pros and cons fully and act as he desired. But this advice was to no purpose, for it came only after Arjuna's demoralisation had been complete. This is evident from the reply which he gave: "I shall do thy bidding".⁸ As a result of this teaching Arjuna did fight, and the war was waged to its bitter end. Such is the argument of those who hold that the Gītā is a gospel of war.

II

It is possible to answer the charge by admitting that the substance of it is a contingency of the acceptable (iṣṭāpatti). The

4. Gītā, II, 12, 13, 16-27.

5. Gītā, XI, 26, 27.

6. Gītā, XI, 33.

7. Gītā, XVIII, 59.

8. Gītā, XVIII, 73.

central teaching of the Gītā is that all should perform their respective duties (*sva-dharma*). The word '*sva-dharma*' in the Gītā connotes *varṇa-dharma*, viz. the duties of the main classes into which society is divided. The duties of a Kṣatriya are: heroism, vigour, firmness, resourcefulness, dauntlessness in battle, generosity and majesty. He is the guardian of society, its protector and preserver. He is the soldier who fights for the freedom of the race and the prefect who keeps the peace of the land. He has to save the social polity from internal dissension and external aggression. Ahimsā is a virtue only with those who belong to the last two stages (*āśrama*) in life, *vānaprastha* and *sannyāsa*. Arjuna who was a Kṣatriya in the second stage of life wanted to pursue the ideal of the *vānaprastha* and the *sannyāsin*. He desired to sacrifice his own *dharma* and embrace another's *dharma*; and that was clearly wrong. An action enjoined by Scripture, though it may entail injury, ought to be performed. The warrior has to welcome a righteous war and do his duty, though it may involve the killing of his own kindred.⁹ There can be no greater boon to him than the opportunity to fight for a good cause. As the Gītācārya says, it is a door to heaven. The Lord of the Gītā advised Arjuna to fight in strict accordance with the Scriptural Law. When all other means of bringing Duryodhana to his senses had failed, there was no option but to wage war against him. The use of force is not only sanctioned but enjoined in such cases. Śrī Kṛṣṇa, the sole purpose of whose advent was to establish *dharma*, could not but give the advice which he did give to Arjuna.

A different line of argument may be pursued in reply to the charge against Śrī Kṛṣṇa's conduct. Śrī Kṛṣṇa was the incarnation of God. He came to the world for a set purpose, viz., the protection of the good and the destruction of the wicked. This divine plan "must be carried out, at whatever cost for the moment, by those who are His agents in the work." Arjuna was the chosen instrument; and he would be made to fight whether he would or no. Willing co-operation on his part would bring him the greatest good, while unwilling obedience would spell his own destruction. Śrī Kṛṣṇa was Time (*Kāla*) made manifest to destroy Duryodhana and his allies. The time had come when, for the good of all humanity, these obstructive objects should be swept away. This was the divine Will; and wisdom on the part of Arjuna re-

9. Śrī Śaṅkara in his Commentary refers to this view as a *pūrvapakṣa*. See Memorial Edition of Śaṅkara's Works, Vol. 11, p. 18.

quired willing obedience to the Lord's command. The ordinary codes of morality cannot be applied to Śrī Kṛṣṇa; for he is above Law and the promulgator of Law. If a man kills another out of his own will, then he is immoral. But if he does so, prompted by the divine Will, then he is not to be blamed. Non-violence is a general rule. The call to violence was made by Śrī Kṛṣṇa as a special command. As between a general rule and a specific injunction, the latter should be preferred. And when that injunction comes from either Scripture or God, there is no sin in carrying it out, however unethical it may appear to be. On the contrary, sin will accrue if it is not obeyed. Śrī Kṛṣṇa asked Arjuna to rise above the ordinary distinctions of good and bad. "Surrendering all dharma come to me alone for shelter. Do not grieve, for I will release thee from all sins."¹⁰

A third line of approach is as follows. To mistake Arjuna's attitude at the commencement of the Great War for that of a true satyāgrahi is to miss the import of satyāgraha. Arjuna's resolve was born of weakness and not of strength. He had no objection to killing as such; he only recoiled from killing his kinsmen. The advice which Śrī Kṛṣṇa gave him was of course to do his duty on the battle field. But at the same time he undermined the ground of violence. He wanted Arjuna to fight without anger, fear and hatred, to remove every trace of selfish desire from his heart and to have the same regard for friend and foe. If these conditions were satisfied, the spirit of non-violence would have been achieved. Śrī Kṛṣṇa did not advocate the abolition of war as a means of settling disputes because the time was not ripe for it. All the same the substance of violence was taken away and only the outer shell was retained. By his teaching he tried to change the whole mental back-ground of the fighting man into one of pure non-violence, while he kept only the external physical form of violence.¹¹

It will be evident that the answers suggested above are unacceptable, either wholly or in part, to the pacifist. Evil must certainly be resisted. But is not non-violent resistance more in keeping with the spirit in man than violent means? "Non-violence is the greatest force at the disposal of mankind. It is mightier than the mightiest weapon of destruction devised by the ingenuity of man. Destruction is not the law of the humans. Man lives freely only by his readiness to die, if need be, at the hands of his brother,

10. *Gītā*, XVIII, 66.

11. See Sri D. S. Sarma : *Krishna and His Song*, Ch. II.

never by killing him.”¹² Judged by this standard, the first two answers suggested above are unsatisfactory. If these were the only possible explanations of the Gītā-teaching, then the pacifist would rather disclaim his faith in the Gītā than renounce his principle. As regards the third view, it is defective because, in so far as it admits the retention of the shell of violence by the Gītācārya, it tacitly avers that the Celestial Song is imperfect. To avoid all difficulty it has been suggested that the Gītā episode is to be understood as an allegory. The battle of Kurukṣetra is the battle of life raging in the heart of every one. The dialogue is between the apparent self and its *alter ego*, the real Self. And the central doctrine is a call for sublimation of all the lower instincts and passions for the sake of reaching perfection. In the remaining part of this paper we shall see if it is possible to read a meaning into the Gītā so as not to do violence either to its teaching or to the doctrine of ahimsā, without resorting to allegory.

III

Let us first apply the pragmatic test to the Gītā. What feelings does it arouse in the mind of its reader? It certainly does not inspire the feelings of hatred and anger which are the spring of violence. On the contrary, every honest student of the Gītā feels that it teaches equanimity, freedom from malice, lust and hate, and devotion to duty without counting the costs or calculating the advantages. To believe that the Gītā was preached for the specific purpose of asking Arjuna to fight is to miss the entire purport. It has been said that the Gītā is “the most beautiful, perhaps the only true philosophical song existing in any known tongue”.¹³ “In point of popularity the Gītā is second to no work in the world of Indian thought. It has always commanded great admiration and its popularity now, if anything, is on the increase.”¹⁴ All this eulogy would be meaningless, if the Gītā were a book of exhortation to violence.

The Gītā is not a mere dharma-śāstra; it is a mokṣa-śāstra. Its primary aim is to save the soul from the slough of saṃsāra. It begins by setting forth the real nature of the Self which is unborn and eternal and proceeds to explain the paths to its realisation. It is attachment to objects born of delusion that binds the soul. Man’s

12. Mahatma Gandhi in the *Harijan*, July 20, 1935.

13. William von Humboldt.

14. Prof. Hiriyanna: *Outlines of Indian Philosophy*, p. 116.

activity is governed by love and hate, and is undertaken for the sake of acquiring what is desirable and avoiding what is undesirable. The process does not end with this; for man's desires increase and he suffers in consequence. A way out of this vicious circle is shown by the Gītācārya. Action is to be performed without desire for its fruit. Instead of having different selfish ends for different actions, let there be only one motive—purification of the heart (ātma-śuddhi) in the case of him who is on the road to perfection, and guidance of the world (lokasaṅgraha) in the case of him who has reached perfection. This is karma-yoga. The same end of freedom from attachment and misery can be achieved through devotion to God. In truth, karma-yoga would be without its soul if there were not on the part of the agent a sense of dedication to the Deity. All work must be regarded as the worship of God. Whatever the devotee does he does for the glory of God. He has no selfish ends to gain. He is indifferent to the fruits of his work. By absolute self-surrender he becomes free from the bonds of saṁsāra. This is bhakti-yoga. Jñāna-yoga is the way of wisdom. At the very commencement of the Gītā Śrī Kṛṣṇa preaches the wisdom of the Self and gives a glorious account of the man of Self-knowledge. The fourth chapter entitled jñāna-yoga contains the praise of wisdom as the panacea for all ills. Man should know the Truth, and the Truth shall make him free. As a background for all this teaching the Gītā explains the nature of the world, soul and God. Hence the Gītā is a philosophical song in every sense of the term, and not a treatise on the ethics of war.

The Gītā expressly teaches ahimsā at least in four places. In X, 5 non-violence is enumerated among the virtues that have their source in God. In XIII, 7 non-violence is taught as an ingredient of true knowledge. In XVI, 2 ahimsā is given the first place among the virtues that constitute the heritage of the gods (daivī-sampat); and Śrī Kṛṣṇa adds: "The heritage of the gods is said to make for deliverance, and that of the demons for bondage. Grieve not, O Arjuna, thou art born to the heritage of the gods".¹⁵ In XVII, 14 ahimsā is regarded as a penance of the body. All this is in keeping with the tradition of the Hindu Śāstras. The Chāndogya Upaniṣad, for instance, teaches ahimsā as the proper gift.¹⁶ The Kalpa-sūtras afford great importance to it in their teaching.¹⁷ The Mahābhārata

15. Gītā, XVI, 5.

16. Chāndogya, III, xvii, 4.

17. Gautama's Kalpa-sūtras, ii, 19, 23; ix, 70.

of which the Gītā forms a part devotes a whole chapter to the 'Reviling of Sacrifice' and extols the principle of ahimsā as constituting 'virtue entire' (sakalo dharmah). It is no doubt true that absolute ahimsā is achieved only in the realisation of one-self as the whole universe¹⁸ and that in a world of claims and counter-claims such as ours a certain amount of himsā is inevitable. Violence is born of fear; and fear persists so long as there is a sense of otherness. It is only with the realisation of the non-dual Reality that all trace of violence will disappear. This is recognised by the great exponent of ahimsā, Mahatma Gandhi. He grants that, so long as there is the dvaita-bhāva, universal non-violence is impossible,¹⁹ that all life in the flesh exists by himsā, and that none, while in the flesh, can be entirely free from himsā, because one never completely renounces the will to live.²⁰ Until the beast in us has been sublimated, there will be the tendency to violence. And no Scripture need teach violence. Himsā is not enjoined by the śāstras; it is only permitted under certain circumstances as a concession to human weakness. The very fact that the Scriptures put restrictions on violence shows that the goal is ahimsā. That is why Śaṅkara in his Commentary on the Gītā remarks that the duty of fighting is not enjoined and that 'Do thou fight' (yudhyasva) is not a command but a re-statement.²¹ And he maintains that the arguments advanced by Śrī Kṛṣṇa in II, 31-38, which constitute the main source of strength for those who regard the Gītā as a gospel of war, are mere worldly considerations adduced to dispel grief and attachment, and that they do not form the main subject of the teaching.²² While studying the Gītā it is better to forget the opening scene of war.²³ In fact, as one listens to the discourse of Kṛṣṇa, one becomes oblivious of the din and clash of war. "As the dialogue proceeds the dramatic element disappears. The echoes of the battle-field die away, and we have only an interview between God and man. The chariot of war becomes the lonely cell of meditation, and a corner of the battle-field where the voices of the world are stilled, a fit place for thoughts on the supreme."²⁴

18. See Sri S. S. Suryanarayana Sastri's article 'Ahimsa and Political Idealism' in the *Aryan Path*, March 1940.

19. *Young India*, March 7, 1925.

20. *Young India*, October 4, 1928.

21. Memorial Edition, Vol. 11, p. 31.

22. Memorial Edition, Vol. 11, p. 48.

23. See Sri C. Rajagopalachari's *Kannan Kattiya Vazhi*, p. 8.

24. Sri S. Radhakrishnan: *Indian Philosophy*, Vol. I, p. 521.

Why then, it may be asked, did the poet of the Mahābhārata introduce the Gītā on the field of Kurukṣetra in the midst of violence and war? It has been suggested²⁵ that the propriety of choosing the battle-field for imparting the teaching is that nowhere else is the subordination of individual aim to the general good so complete. The soldier represents the specimen of an unselfish worker. He may know the cause for which he is fighting. But what will be the result he does not know. Even if his cause succeeds, he may not be there after all to benefit by it. On account of this uncertainty he is not to shirk his responsibility. He has to do his best and serve to his utmost capacity. "That represents the highest form of self-sacrifice—to work for no profit to oneself, but yet to exert oneself to the utmost; and the finest exhibition of this spirit in the world is to be seen on a battle-field." While agreeing with this explanation, we should like to hazard another suggestion. The Gītā teaches mainly the excellence of karma-yoga; it shows a way of doing things without getting enmeshed in saṃsāra by becoming attached to them. Fighting is the most violent kind of action, as it embodies "the very quintessence of activity, the rush of it, the whirl of it, the turmoil of it, the din of it." The meaning of selecting such a crisis to teach the gospel of karma-yoga is to show that the yogin is unperturbed and unruffled even in the midst of universal disaster. "The man into whom all desires enter as the waters enter into the sea, which, though ever filled, remains within its bounds—such a man attains to peace, and not he who hugs his desires."²⁶ The setting of the Gītā is to be interpreted in the same way as the passage of the Kauṣītakī Upaniṣad, which says that even such heinous crimes as matricide, parricide, theft and infanticide do not affect him who is released, is to be understood. A true karmayogin will be incapable of violence, even as the very nature of the mukta cannot lead him to sinful ways.

25. See Prof. Hiriyanna's *Outlines of Indian Philosophy*, p. 123.

26. *Gītā*, II, 70.

RELIGION—TRUE AND FALSE*

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The mental climate of our age is being largely determined by the unrepentant scientists and a few humanists. Both these schools of thought are out to attack the reality of the unseen on which the entire structure of religious experience rests.

The enemies of religion to-day are legion. The foremost among the foes of religion is the creed of the impenitent scientist who cannot look beyond his nose. To him there is nothing mysterious at the heart of the universe which the laws of mechanics cannot explain, if not to-day, at least at some distant date.¹ He believes that such knowledge as is derived through the scientifically varifiable channels alone is entitled to claim validity. He swears by tangible evidence and laboratory proof. He does not see any purpose in the universe or any point in life. The supersensuous and the hyperphysical are non-existent to him. To him the traditional values, Truth, Beauty and Goodness are the mere projections of the human mind, a process of wishful thinking. An empirical inquiry into the happenings of History does not disclose any very definite pattern or the working out of any process.² The purpose of life is life itself. The codes and the conventions of social life are adjustments made to meet the fundamental human needs, food and sex. All that the scientists plead for is an all-round development of life, an education of the senses. A care-

* Substance of a University Extension Lecture delivered on 28-8-40.

1. Cf. Lancelot Hogben's address to the British Association of Science, Cape Town, "The Modern mechanist does not say that love and heroism do not exist," but he says, "show me the behaviour to which you apply the adjective thoughtful, loving or heroic and we will one fine day endeavour to arrive at predictable conclusions with reference to it, following only methods of enquiry which you have learnt by experience to trust."

2. H. A. L. Fisher, in the Preface to his History of Europe says, "One intellectual excitement has, however, been denied me. Men wiser and more learned than I have discerned in history a plot, a rhythm, a predetermined pattern. These harmonies are concealed from me."

ful cultivation of tastes and a calculated indulgence of passions should be the governing policy in life. "No God must be cheated and none overpaid." This, in short, is the creed of the scientifically illumined.

There are a number of scientists who are humanists. They want men to lead a good life but not a godly one. The good life is enough. If we are kind and tolerant, good tempered and unselfish that is enough. Amiability and good will can save men from troubles. This school of thought asks us not to rely on the super-natural, but subordinate the selfish in us. They exhort men not to interpret the universe but to change it. They suggest definite blue prints for the salvaging of civilisation. They say that 'life on this earth is something definite and let us make it better;' let us make two blades of grass grow where there was one.

Marxism and Psycho-analysis are the two secular religions of our moderns. Marx held that religion devitalises men. He described it as the heart of the heartless world, the soul of the soul-less conditions and the opium of the mind. Religion is said to perpetuate the iniquities of the present social order. They link the rise of religion with capitalism. They account for the existence of reactionary spirit, rickety institutions and social indifferentism as due to religion. The complacent acquiescence of men in the existing social order as necessary is said to be due to religion. To get rid of all these things Marxism asks us to give up religion, and believe in class-war, materialist interpretation of history, i.e., that the economic is the chief factor in the determination of the events in history. The whole of reality according to Marx moves in a definite pattern. The validity of this statement is on no greater level than the fundamentals of any theology. Marxism is the first of the false religions of our age. The paradise they hope to realise is a class-less society where the individual has no private life or objective of his own except those set forth by the state. Communism as a secular religion does not satisfy what is deep in men. It is too simple a solution of the complex activities of men. It is a mere caricature to reduce the aspirations, heroism, sacrifices etc., of noble men and women to factors of money power. Communism is anti-human. It is the attempt of a military minority drunk with the ideology of a partial Realist to mould the opinions of a population forcibly in accordance with a preconceived pattern like a gardener who cuts the grass to the shapes of peacocks. Men are not allowed to develop according to the laws of growth inherent to them. Such a stereotyped regimentation results in the produc-

tion of not the normal individual but the grotesque. Hence this secular religion does not attract men.

Specially after the recent foreign policy of Russia, serious minded students of politics have become sceptical about communism. This political faith is no longer the channel for catching waters of youthful idealism. "Communism is now only a convention and is no longer a revelation, it is a fashion to be followed rather than a truth to be fought for."³

The grave historical times in which we live encourage only secularism and a short term view of life. It does not help to believe in any religion. As Prof. Joad puts it, our age is an age of demolition. There are no secure jobs for the young needing their services. The fear of unemployment and the uncertainty of the future promote only a short term view of life. Hence the modern young men are derisive of both heavenly rewards and infernal punishments. Freudian psychology has given an academic backing to it and has made license respectable. Hence the admonition to control ourselves is besides the point.

In the midst of such a distracted world besides communism we find another false religion, in the garb of efficient Totalitarian powers crushing the whole world under the military jack-boot. The advance of scientific materialism and the corruption of the churches have undermined the faith of the average individual in religion. This impression of the faith in the divine gave rise to surprising outlets. The human need to believe can never be eradicated. Man cannot put up with a spiritual vacuum. There is a persistent cry in man for a god. If he cannot find a God in heaven, he must fall down before a god on earth. That God on earth, turns out to be a Hitler or Mussolini or Stalin. Hence Fascism is a distorted version of man's need for a religion.⁴

Dogmatism is another enemy of genuine religion, itself masquerading as a religion. The dogmatists deny as categorically as the Naturalist the existence of mystery at the heart of the universe. They talk as if they know all about the Maker and as men who assisted god in the construction of hell and heaven. To the dogmatist religion is found between the two covers of the sacred books as interpreted by the prophets. Dogmatism institutionalises reli-

3. See Prof. Joad's "Philosophy for our Times," Chapter I.

4. Cf. Prof. Joad's Chapter on *Fascism* in his book on the *Philosophy of Morals and Politics*.

gion and stands for a rigid code of doctrines and regular round of rituals. They spent most of their time in discussing theological dogmas exhibiting their infinite capacity for making obscure details verbally clear. They have their definite conceptions of god, with qualities more powerful than those of human beings. The God of one religion is Satan to the other religionists. It is in the name of these rival gods that most of the religious wars in Europe have been fought. The evils of an 'affirmative theology' are many. The least of them all is fanaticism. These fundamentalists mistake the existing social institutions to be ordained by God and hence unalterable. They uphold the *status quo*.

We have so far examined the nature of false religions that have attacked the true spiritual religion which has been attested to by a long line of mystics of different countries and climes. There are some who ask us not to fly in the face of facts and argue away the determinist element in the universe. They ask us in the spirit of the humanists to take the arts and literature as substitutes for religion. They say that the satisfaction we need can be achieved in the world of art and poetry. Many a savant of humanity has put forth this suggestion that art and poetry are enough for man. But it can hardly take the place of religion. In the words of a learned professor of literature, poetry revels in the antinomies of emotion, while religion tries to transcend them.⁵ Poetry lives and moves and has its being amidst the many, while religion ascends to the one. Therefore, as an English mystic poet has said, poetry cannot save the soul, but makes it worth saving. Poetry enriches the treasures of the heart of man and religion offers them at the feet of God. Poetry at best can be a portal to prayer.

Genuine religion is not against the fundamentals of science.⁶ It has the sanctions of religion. Men like Eddington, Jeans and Whitehead have proved that science is not incompatible with spiritual life. Religion in the words of Aldous Huxley is a system of education by means of which human beings may train themselves, first to make desirable changes in their own personalities and, at one remove, in society, and, in the second place, to heighten consciousness and so establish more adequate relations between themselves and the universe of which they are parts. The essence of religion is experience. It is spiritual experience. Spiri-

5. See Prof. D. S. Sarma's article on 'Poetry and Religion', p. 10. *How It Strikes a Hindu*.

6. See author's article on 'Science and Reality,' *Journal of Oriental Research*, Vol. XIV, part 1.

tuallity, in the words of Radhakrishnan, is the core of religion, and mysticism emphasises this aspect of religion.⁷ Religion is integral experience. To the spiritual aspirant God is not a logical factor, but a real experience. The reality of spiritual experience remains unaffected by the advance of a science and criticism of history. The spiritual experience knows no limit. It is not confined to any distinct view of life. It is the eternal need of man. No revelation is final in the history of the spirit. It is a progressive experience. The men of religious experience breathe the spirit of religion. The content of spiritual experience is hyperphysical and supersensuous. It is what is beyond the scientist's ken and his measuring rods. Science did not and still does not possess intellectual instruments with which to deal with those aspects of reality, i.e., the experience of mystic ecstasy, the intimations of Godhead. The mere fact that there is a growing indifference to organised religion is no guarantee that religion has lost its hold on the minds of men. Mysticism which is the core of religion is opposed to Naturalism as well as to dogmatism.⁸ Both agree in driving away the mystery from the factor of *Mysterium Tremendum*. Religion is a personal experience of God, immediate and direct. "It is the concurrent activity of thought feeling and will. It satisfies the logical demand for abiding certainty, the aesthetic longing for repose and the ethical desire for perfection." This experience is called by various names, fellowship with God, Brahman-realisation etc. Such experience transforms the apparent individuality of the finite self. It is not mere imagination, because the object of its experience is *bona fide*. To the mystic, God is as much a fact as the leaf is to the botanist. The Upaniṣads declare that there is nothing superior to the puruṣa.⁹ Hence to the man of religion man cannot be dissolved into a few pounds of carbon and a few quarts of water. Man is not body plus a mind, but is essentially spirit. The great mystics of the world have realised this experience and have set down in verse and prose their experiences. The characteristics of religious experience can be set down

7. A. C. Bradley's *Ideals of Religion*. "In the end there must be mystery for us; the claim to possess the whole truth, to know what God is as God Himself knows it, is that blasphemy of the abstract mind against which we have to be constantly on the guard."

8. "Intolerance is irreligion" M. K. Gandhi.

Over the door of Śāntiniketan, the home of the Tagores, runs the following incscription, "In this place no image is to be adored and no man's faith is to be despised."

9. Kāṭha Upaniṣad, I, 3, 11.

as follows: It is not clearly differentiated into a subject object relation, it is integral and undivided. It represents the entire being of men. It is self-sufficient and complete. It is self-established (svatassiddha) self-evidencing (svasamvedya) and self-luminous (svayam-prakāśa). It is described by Radhakrishnan as follows: It is pure comprehension, entire significance, and complete validity. The mind sees, the will consents and soul approves. When the individual withdraws his soul from all outward events, gathers himself together inwardly, and strives with concentration, there breaks upon him an experience secret, strange and wondrous which quickens within him, lays hold on him and becomes his very being.

It is this kind of genuine religious experience that can be called spiritual. The world has not suffered because of religion, but because of the want of a proper religion. No man of genuine religious experience will fail to reconstruct society on the basis of love and justice. Before any great change is effected the individual must be reformed. Political adjustments and economic schemes would prove of very little use, if the individual were not to change. The new social order must be built on the moral regeneration of men. No moral regeneration of men is possible without a religious experience. Some may hold that they are not able to experience the religious feeling. This is no argument against religion. Aldous Huxley has a clever answer to these doubting Thomases. Of the significant and pleasurable experiences of life only the simplest are open indiscriminately to all. The rest cannot be had except to those who have undergone a suitable training. One must be trained to enjoy the pleasures of alcohol and tobacco; first whiskies seem revolting, the first pipe turns even the strongest of boyish stomachs—the first differential equation is a sheer torture.¹⁰ So from this it follows that we must prepare ourselves for the religious experience, by leading a very moral life; ethical excellence is a necessary step for God realisation. In the words of St. John of the Cross we must empty our soul of greed, ambition and other worldly desires before we receive the grace of God. There is a necessity for a preparedness of the soul. "Religion is like the string of a violin; if removed from its resonant body it will give the wrong tune."

From the above enquiry it follows that religion which is based on spiritual experience, far from being a hindrance to society, is a source of great help. Every religion from Paganism to Vedānta has contributed to the well being of men. What we need is not a change of religion but a vitalising of the one in which we are.

10. Huxley's *Ends and Means*, p. 286-288.

REVIEWS.

OXFORD PAMPHLETS ON WORLD AFFAIRS

The Clarendon Press is doing a real service by the issue of the excellent series of Oxford pamphlets on world affairs, pamphlets at once instructive and provocative of thought, as may be expected from the eminence of the contributors. Written primarily from the English standpoint and meant chiefly for the instruction of the English people, they easily take a place far above that of mere propaganda literature. The information furnished in each topic is fairly full and accurate, and the comment is nowhere unduly biased. This series of little books is altogether a welcome aid to the understanding of the issues relating to the war, or rather the wars, now being waged in different parts of Europe and Africa.

The first of the pamphlets is an attempt by Sir Alfred Zimmern to judge the '*Prospects of Civilisation*'. Deprecating alike the optimism of 1919 and the pessimism of 1939, he distinguishes three aspects of the problem before us, the immediate political problem involved in the conflict with totalitarianism, the long-distance problem of sound economic distribution and internationalism and the permanent ethical problem due to the tension between moral ideals and political realities. The permanent problem has been intensified partly because the sphere of political realities to be considered has become vaster and partly because our own moral standards have become largely unsettled. The sanction of punishment, here or hereafter, has given place to the sanction of defeat. In the nature of things there can be no complete solution, since the ethical problem necessarily implies tension; there is, however, the possibility of improving on the present state of affairs and finding a *via media* between "doctrinaire rigidity and a pliable opportunism." The long-distance problem of due economic distribution will admit of solution if we do not demand too much; it is no good trying to thrust a fully fledged scheme of internationalism down the throat of the ordinary man; it will be enough if we can educate him to be world-minded for *some* of his time instead of demanding he should be world-minded *all* the time; we should get on with the least possible change instead of attempting the greatest possible change; for with the discrediting of the 'inheritance of acquired characters' we have to reckon with the biological fact, that the man we have to

deal with continues essentially small-scale, while the world he has to respond to has become large-scale. The solutions of the major problems not being too hopeful, it is no surprise to see that the author is not very convincing in his treatment of the political problem. Totalitarianism is a false god, a Moloch, with whom there can be no parleying; it is an atavistic frenzy to be resisted at all costs; this political immaturity or aberration is not sought to be explained, though it is realised that 'until that chronic condition has yielded to treatment, the progress of international co-operation will be delayed.' Sir Alfred's treatment is meant to be clear and is certainly honest; but in his own phraseology it only brings home to us the conviction what small-scale men we are and what a large-scale problem we are up against.

Mr. H. V. Hodson, Editor, of the "Round Table," explains and defines the status and the relationship between the various members of the British Commonwealth of Nations. He describes the machinery of the "*British Empire*" touching matters such as Dominion Neutrality in war time, co-ordination for defence, trade relations, and migration.

E.A.

Mr. R. C. K. Ensor, Fellow of Corpus Christie, Oxford, is the author of more than one pamphlet in this series. The first of these relates to '*Mein Kampf*' and Herr Hitler's self-disclosure therein. "Ill-arranged and confusing as it is *Mein Kampf* by no means lacks logic." Frankness is another outstanding feature; while Hitler consistently gulls gullible humanity, he makes no secret of that policy, but parades it in the book. The leading idea is the apotheosis of the Aryan race, the race that has made the only notable contributions to civilisation, though repeatedly its edifices have collapsed because of miscegenation. The Germans and the British to a great extent represent this Nordic race; other races have either to be subjugated like the Slavs or exterminated like the Jews. This race-dogma flourished on the Post-War German soil since apart from the inferiority complex of a defeated nation seeking some compensatory solace, Germans unlike the French, British or Americans were not till recently knit together as a *nation*. The other leading idea is *Lebensraum*; a growing country requires room for expansion unless it urbanises itself, depends on export which is at the mercy of countless foreign vicissitudes and continues as a compact unit, vulnera-

ble in war; expansion must be achieved with the sword and consolidated with the plough; the future great Germany is to be essentially rural, and this has to be made possible by extensive expansion (especially in the East) and a remorseless pursuit of the policy "might is right." If this had been realised by the Western powers, they would not have been as complaisant as they were down to jettisoning Czecho-Slovakia. Hitler's only touchstone for word or deed is success; yet with this cynicism goes a queer idealism, advocating effort, duty and self-sacrifice; and his call has not fallen on deaf ears. He has shown what a lone man of spirit with a single blackthorn can do against nerveless adversaries each with ten pistols. Is it too late for the others to act? They have certainly got on to the carefully prepared morass; whether they can get out—that is prediction or propaganda; and neither interests Mr. Ensor who has given us this excellent picture of Hitler, the man and the book.

Julian Huxley had declared himself in no uncertain terms even before this war, against the race-fad. He returns to the theme in *'Race' in Europe*. The word 'race' has no fixed meaning as will be seen on consulting any respectable dictionary. Applied to human beings it is a myth and a dangerous one at that. Even in such relatively small groups like the Scottish or Irish clans kinship could be acquired and even bought without dependence on a mysterious blood-thicker-than-water. An enthusiastic philologist in a moment of weakness spoke of an Aryan race, when the unity of an Aryan tongue was all that he needed; and in spite of the confession of his mistake, the evil he did continued to flourish and lift its monstrous head under the championship of Hitler. Where races or types can be distinguished, no one type can claim exclusive superiority; the Mediterranean type has contributed at least as much to civilisation as the Nordic; and the mixture of types has been beneficial rather than the reverse. "Goethe, Beethoven and Kant were medium or round-headed, not long-headed—Napoleon, Shakespeare, Einstein, Galileo—a dozen great names spring to mind which in themselves should be enough to disperse the Nordic myth" this pagan god (in the words of R. G. Collingwood) deified as a cloak for aggressively selfish economic aims.

The Fourteen Points and the Treaty of Versailles examines the Treaty of Versailles with a view to determine how far the treaty violated the Fourteen Points, and how

far such violation may be said to have brought about the aggressions of Nazi Germany. It is argued that the Fourteen Points were vague in their contents, that some of them had been repudiated or accepted only in a modified form by the allies in the pre-armistice agreement, that only a few of them had a direct bearing on Germany's position and these were interpreted as fairly as possible, and that in any event Germany was treated more considerately than she could have hoped for in the circumstances. In the course of the argument, it is admitted that over the war guilt clause, reparations, colonies, the Saar mines and so on, Germany was irritated and was provided with first class propaganda material. For all its defects, says Mr. G. M. Gathorne, citing Dr. Seton Watson, the treaty was 'the first international settlement which its authors deliberately tried to erect upon definite ethical principles.' But the measure of success attained in this endeavour has not been great; and ethics and politics still stand as far apart as ever.

K.A.N.

R. R. Kuczynski: "*Living Space*" and *Population Problems*, 31 pp. This interesting pamphlet discusses the problem of "Lebensraum." The author had described in some detail the population positions and policies of the two most outstanding totalitarian States of to-day, Germany and Italy. With special reference to Germany, he has also discussed the economic potentialities of her former colonies and has suggested that her present economic position without those colonies is more valuable than with them before the War of 1914-18, because she is now more self-sufficient than before in food-stuffs and even in raw materials. Nor does Germany want, he says, colonies to relieve her from the pressure of population. On the other hand, she wants and deliberately encourages an increase in the number of her hands. Therefore the German slogan of "Lebensraum", says Dr. Kuczynski, has little meaning.

P.J.T.

Mr. G. F. Hudson, gives in this small booklet "*Turkey, Greece and the Eastern Mediterranean, (1939)*" a brief analysis of the relations since the beginning of the present century between the three Mediterranean Powers, Italy, Greece and Turkey, influenced now and again by the attitude of the Great European powers, Britain, France and Russia. Turkey formed the main object of the attention of Italy and Greece which made successive attempts to occupy

Turkish possessions in the Eastern Mediterranean as well as in the mainland of Asia Minor, particularly the island-group, the Dodecanese and the two big islands of Chios and Mytelene which have since become Italian and Greek possessions respectively. The proposals for the partition of Turkey between Greece Italy and France during the last war and the actual occupation of Smyrna by Greece are described at length. The rise of Kemal Pasha Ataturk to power (1920) and the consolidation of the Turkish nation under him with active support from Soviet Russia forms the most interesting episode of post-War Turkish History. The booklet closes with the narration of the circumstances under which Greece and Turkey, the erstwhile enemies, have now become mutual friends under the threat of Fascist Italy's imperialistic ambitions. The two maps (1) showing the division of Turkey according to the secret treaties of 1915-17 and the treaties of 1920 and (2) showing the position and strategic importance of the Italian possessions in the Eastern Mediterranean are helpful.

N.V.R.

In the pamphlet "*The Danube Basin*," Mr. C. A. Macartney gives in clear outline the problems relating to the different nationalities that live in the Danube Basin, viz., the Balkan States. The principle of self-determination applied to these states subsequent to the last war failed to bear fruit owing to the fact that these nationalities had 'no stable institutions and historic independence which crystallise the consciousness of the nationality'. The different races that live in the Balkans viz., the Czechs, the Slovaks, Serbs, Croats, Slovenes, the Magyars, the Ruthenes and the Austrians have racial boundaries that run counter to the geographical factors. A detailed account of the activities of the neighbouring bigger states of Italy, Russia and Germany in the Balkan states, the Post-War settlement of these states, the influence and the part played by the League of Nations in the Balkan affairs, and finally the rise of Nazi Germany and the problems created by its philosophy of Lebensraum are all discussed in the pamphlet at some length. On the inside of its two outer covers there are two maps of the Danubian states and central Europe to guide the reader.

N.V.R.

In the *Dual Policy*, Sir Arthur Salter discusses the policy pursued by the British Government since March 1939—resistance to force, and the building of peace. The Federal Union scheme for

world peace was perhaps initiated just too late. In this Pamphlet Sir Arthur suggests another scheme—that the British Government should work out in detail a constructive peace plan, which should take into account the Versailles Treaty, ‘encirclement,’ Lebensraum, economic opportunity, colonies, etc. and publish it as a State Paper circulated among the governments of the world. “A broadly conceived and magnanimous, constructive peace policy, presented as a White Paper....might transform the whole international situation.”

E. A.

Propaganda is the most recent instrument of Foreign Policy, and plays so important a part in international affairs that some idea of its origin, character and function is essential to-day. The Communists were pioneers in this direction, but it was during the Great War that its effect was clearly revealed, for few will deny that the Great War was won by a combination of military power, economic power and propaganda. With the establishment of the Ministry of Popular Enlightenment in Germany, the Ministry of Popular Culture in Italy and the Foreign Publicity Department of the Foreign Office in Britain, propaganda was established as a peacetime policy. Professor E. H. Carr has some interesting points to make concerning *Propaganda in International Politics*. As an instrument of foreign policy it cannot be dissociated from political power—it cannot be international, and to achieve its maximum effect it must be as near the truth as possible and have some moral sanction or appeal.

E.A.

In ‘*Encirclement*’ Brierly shows that this cry was first started by Bülow to overcome the resistance to successive expansions of the German navy. The element of truth in the charge in recent years, especially since March 1939, is allowed, but it is rightly pointed out that the geographical position of the Axis powers enabled them to carry out some successive exercises in this game against their opponents, and that retaliation became a necessity for those that were threatened.

K.A.N.

Vice-President of the Refugee Settlement Commission in Athens from 1926 to 1930, Sir John Hope Simpson is best fitted to tackle

the "*Refugee Problem*" which is assuming more and more serious proportions with the growth of a false sense of nationalism and the consequent racial persecution. The magnitude of the problem is still more enhanced by the frequent outbreaks of wars in general. It has almost developed to an extent at which it is impossible for individual charity to face the question squarely. The problem is becoming increasingly political. The Evian Committee and the Inter-governmental Committee have to some extent mitigated the rigour. But the final solution is still to be settled. The author suggests future possibilities for a radical solution.

V.R.R.

Brest-Litovsk is a study in the contrast between the circumstances under which Germans met the Russians in Conference in this city on two occasions—once in March 1918 and again in September 1939. On the first occasion European Russia was dismembered by a victorious Germany; 'she was cut off from the Black Sea and very nearly from the Baltic also.' Then Germany achieved some unintended results too; she furnished fair warning of what her foes had to expect if they lost the war; she helped to save the Russian Revolution, and prepare the Revolution at home; lastly by rousing fears of possible German penetration in Asiatic Russia, she indirectly enabled Japan to send her troops into Siberia where they remained till 1922, an important stage in the development of Japanese policy in Eastern Asia. Twenty-one years later, Russia had the whip hand. Hitler was the suppliant desperately anxious to win over Stalin to his side, and Stalin eager to pay off 'the rebuff of Munich'. The 'speed and depth' of Soviet advance to-day is a source of surprise and anxiety to Hitler himself, and 1939 has achieved much more than merely recover the ground lost in 1918. The end of the second "Brest-Litovsk" is not yet; 'for it is but a short step from National Socialism to National Bolshevism'.

K.A.N.

Czechoslovakia by R. Birley is an outline of the history of the Czech people and their culture from their entry into the Bohemian plain in the sixth century A.D. In the ninth century Bohemia formed part of the Moravian kingdom Svatopluk. With the conversion of the Czechs from Constantinople the turn of history cut them off from the East. The break up of Svatopluk's kingdom in 894 created Bohemia. Situated in the midst of Teutonic

lands, it began to be affected by German influence. The next great figure in Bohemian history was Charles who became Holy Roman emperor in 1346, who was responsible for founding the University of Prague in 1348. In course of time Bohemia got united with Hungary. Religious wars led the Czechs to embrace again Catholicism and to become part of a Jesuit culture. Prague University was handed over to the Jesuits in 1623. From this time the development of Czech culture was arrested. In the latter half of the 18th century German became the official language of the country. The 19th century witnessed the revival of the Czechs, an artistic revival. After the war of 1914-18 the Republic of Czechoslovakia was created. But its essential problem was foreign policy. In 1938 Germany demanded security of the German minority and in March 1939 its western portion was occupied by the Germans and made a province of the Reich. Slovakia became a German protectorate and Ruthenia was annexed by Hungary.

V. R. R.

W. Arnold Forster's *The Blockade—1914-19* deals with the various measures taken by the Allied Powers during the last war to blockade Germany and their working during the war. Mr. Arnold Forster has shown that considerable quantities of food were sent into Germany before peace was signed, despite a widespread but erroneous belief to the contrary.

P.J.T.

The cult of Blood, Race and Soil cannot but come into clash with the Churches, whether Protestant or Christian, except in extreme cases like that of the "German Christians" who have adopted wholesale the Nazi formula. The story of this conflict, of the Aryanising of Christ who waged war against the Jews, of the exaltation of 'honour' in contrast with the traditional Christian virtues (Nietzsche called them slave-morality) of meekness, self-sacrifice, etc., of the concordats made only to be violated since they were so blatantly at variance with the Nazi *Weltanschauung*, of the persecutions and calumnies and of the present unhappy positions of both churches, this is graphically told by Principal Micklem of Mansfield College in *National Socialism and Christianity*. The only comment one would like to make is this. It may be that the church cannot leave politics alone if it desires to keep in touch with its flock and mundane affairs. It behoves it then to be ultracautious

in its judgments, to be more sober than the most critical of the laity, and to avoid rushing to a real Scylla in avoiding a (possibly imaginary) Charybdis. Yet the Roman Catholic church at least would appear to have failed signally in the exercise of such caution. Who does not know the sympathy of the Catholic clergy with the intervention of the axis-powers in Spain, all because of the Bolshevik persecution of religion? Which was the greater danger, the irreligion of the Bolshevik or the heathenism of the Nazi?

Mr. Ensor's account of Hitler's ideas cannot be complete without a picture of his personality and a sketch of his career. This Mr. Ensor provides in *Who Hitler Is*. The phenomenal rise of a man from lance-corporal at 30 to Chancellor at 45, the rise of the influence of a party from 12 seats in 1928 to 107 seats in 1930, these are the main themes of the pamphlet. The details of the rise are best told in Mr. Ensor's own words; but the story offers repeated justification of Hitler's guiding principle "Nothing succeeds like success". Throughout Hitler has stuck to his fundamental ideas and realised them ever ruthlessly—the extirpation of the Jews, the re-armament of Germany in bold defiance of the Allied Powers, the unification of the German people and the expansion of Germany towards the East. His alliance with Russia is a breach with his original beliefs. Does that spell misfortune? Or is it a "lucky break" like the earlier abandonment of cranky economic ideas, when he became Führer of the Nation?

The sanctity of law and the independence of the judiciary are cardinal principles of any sound constitution. Yet they are among the first to be sacrificed with the coming to power of persons or parties who have long suffered under an inferiority complex. This process of deterioration which culminates in a judiciary that is a creature of the Executive and a law that is the deliverance of a Dictator, is clearly sketched in the case of Germany by J. Walter Jones, under the title *The Nazi Conception of Law*. Even prior to 1939, the leadership principle and the racial principle had been accepted by the Nazis. The leader is the true representative of the people; his is authoritarian, not atomistic, democracy, but it is real democracy all the same. The State is indissolubly bound up with law; it is indeed a *Rechtstaat*; it is not, however, bound by statutes which after all form only a minor part of the law; the non-statutory part of the will depends neither on the codes of minor corporations

within the state nor on the interpretations and decisions of judges, but on the decision of the leader. That is where we have the travesty of a notion of law, sound at the core, indeed sounder than the ancient Austinian conception; the latter was despotic in form, not in application; the former was essentially democratic in form, but has turned out despotic in application. And the travesty is more intense when it is insisted that the people whose spirit the law is taken to represent should be a homogenous unit, and belong to one race, the Aryan race for preference. As practical consequences of the reaction against non-Aryan, i.e., Roman law, private ownership and even possession are discountenanced, contracts are easily flouted on the ground of unilateral declarations of impossibility of performance, judicial interpretation of contracts has become over-free, and there is aversion to arbitration. The attitude to the criminal within the State is as ruthless as towards a foreign foe. If the court can find no statute under which to convict, it should still do so, according to sound popular sentiment. The fate of International Law for such an attitude needs little elaboration.

Mr. J. N. L. Baker has prepared a very useful *Atlas of the War*, with fifteen maps and some explanatory notes. Of the maps, that of the Western Front (No. 12) has become out of date. The notes are calculated not only to inform the reader but also guide his thinking.

Sir W. Beveridge's *Blockade and the Civilian Population* examines the probable effects of the Allied Blockade on the civilian population of Germany, and gives a short but thoroughgoing analysis of the relationship between armaments and foodstuffs on the one hand and of Germany's food position and supplies on the other. It also presents Field-Marshal Goering's alternative of "guns or butter" as a remarkably true statement of the actual position of Germany in this respect. The analysis is entirely factual and hence convincing. And he has well brought out the need for preventing fats for Germany—which she most needs also—as an essential war measure, because fats are directly convertible into armaments, though not identical with them. On the whole, Sir William Beveridge has written a valuable Pamphlet making out in a clear and analytical way an important and constructive point in the successful working of the economic warfare against Germany.

P.J.T.

In *The Naval Role in Modern Warfare* Admiral Sir Herbert Richmond gives an admirable study of a very important subject. The author who is an authority on naval matters prefaces his study with Rules of war such as have been generally accepted by the civilised nations barring Germany. He quotes the German war book according to which no obligation need be binding when its observance stands in the way of military or political success. He traces the changes that have taken place since the last war, particularly phenomenal increase in air arm. He goes on to discuss the three measures of trade defence—cruising, convoy and depriving commerce raiders of supplies. After examining the position of Neutrals and supply ships, he points out the misuse of submarines and mines by the enemy setting at naught all international agreements. Those who want to know the fundamental principles of British naval strategy to-day will be amply profited by a perusal of this pamphlet.

V.R.R.

J. H. Jackson succinctly explains in *The Baltic* the Teutonic and mediaeval origins of Baltic nationalism, the failure of attempts to Russianise the Balts, and the emergence of independent Baltic states of Finland, Esthonia, Latvia and Lithuania from the Great War. 'The period between 1920 and 1935 was a golden age in the Baltic'. And when troubles leading to the present war began, Russia made it a condition of her joining in the guarantee to Poland that the Baltic States must be included in it, but the Baltic States 'not unnaturally preferred the risk of German aggression to the certainty of Soviet military occupation'. But they gained thus only a short reprieve; and 'the shape of things to come is anything but clear'.

K.A.N.

In *Britain's Air Power* Mr. E. Colston Shepherd deals with some special problems of Britain's Air Force and with the organisation of the R. A. F. In the last war the aeroplane was mainly the reconnaissance aeroplane and was deemed by both Navy and Army as a valuable scout to bring in information of enemy movements. But to-day its functions have been widened. We have twenty different types of aeroplanes. Among them the chief are fighters, bombers and reconnaissance aeroplanes. The fighter is for defence against enemy aircraft while the bomber

attacks enemy objectives. The British bombers are splendidly armed and generally fly in formation. In the last few weeks the work of the British fighters and bombers is something marvellous and shows the high efficiency of the service which is backed by the great supply organisation of the Air Ministry and the Aircraft Industry. With the willing co-operation of the Dominions the Air arm of Britain is growing day by day and inspires full confidence in all lovers of democracy.

V.R.R.

Dr. J. A. Williamson, unlike Mr. Hodson, is more historical in his treatment of the *Life and Growth of the British Empire*. He answers Herr Hitler's charge that forty four million Englishmen own more than a quarter of the world's territory—with the implication that the world cries out for justice. It is difficult to say in so small a compass all that should be said, but Dr. Williamson's reply is liberal and convincing.

E.A.

Max Nicholson's *How Britain's Resources are mobilized* deals with the efforts made, especially the State controls set up, in Britain for the purpose of conducting the war. It explains in a nutshell the entire machinery of administrative control during war time. Each of the five forces—Navy, Army, Air Force, Economic Warfare, Propaganda—has its own department namely, the Admiralty, War Office, Air Ministry, Ministry of Economic Warfare and Ministry of Information. A sixth department, the Ministry of Home Security, is the latest addition. The author also deals with the six big economic departments, concerned with economic mobilization, namely the Treasury, the Ministries of Supply, Food, Shipping, Labour and National Service. The whole of this war machinery is described in a clear and concise manner.

P.J.T.

Mr. Percival Spear reviewing the question of *Communal Harmony* in India offers what he considers an equitable solution, based on the distinction of political from cultural activities and the devising of suitable guilds for the conduct of the latter without conflict. Thus will be solved India's supreme problem of how "to combine unity with variety." The guilds would have both administra-

tive and legislative authority; they could effectively legislate about matters of personal and private law; there would be no longer Muslim votes determining the form of a Hindu valid marriage. No doubt this may mean an initial strengthening of the conservative forces; but even this will make way for progress. There will be both provincial and national guilds; the latter will deal with measures like the Sarda Act affecting the whole of any community. Communities as such may and should find representation in second chambers, wherein any community could veto a proposal if but it be unanimous. Where there is clash between guild and government the Federal Court may decide. Mr. Spear has also some interesting suggestions to make about such vexed problems as the Army, the Central Executive, Patronage and so on. And his scheme as a whole looks rather good on paper at the first blush. The trouble will start in effecting a demarcation between the political and the cultural. Where does education belong? Obviously it must be controlled by the guilds; and equally obviously, it should be managed by a central body which will not encourage communalism and conflict, as the guilds are likely to. Mr. Spear casually speaks of two guilds, one for the Brahmins and the other for the non-Brahmins in the South. Will one guild suffice for the latter? And will the non-Brahmins ever agree to equality of political representation for the Brahmin guild? Again, a measure like the Sarda Act is concerned not with religious prejudices alone but also with national health. Is such a matter to be decided by the general legislature or by the guild? If particular guilds are recalcitrant or unduly conservative what is the remedy where the issue is national? Altogether, Mr. Spear's suggestion raises at least as many problems as it solves; and the last word on communal harmony has not yet been said.

The Foreign Secretary, Viscount Halifax, is also the Chancellor of Oxford University and in this dual personality delivered an address on *The Challenge to Liberty*. His Lordship develops the contrast between the present war and the last great war; in the latter there was a feeling that the old men and the politicians went to war, sacrificing the youth of all countries; now it is a conflict of youth with youth, since the vicious ideology that has proved the struggle has permeated the entire nation and warped its outlook. The present pass is not due merely to "the mistakes, the pride and the selfishness of an older generation." The moral retrogression in Europe is astonishing particularly the "devastating perversion

of youth in Germany. There is no choice but to resist and defeat by force the attack to which those [non-Nazi] ideals....are now exposed." That way may be established a better, though perhaps not an easier world. There is reason to be hopeful about the future despite disillusion about the past; we are sure of the goal and the way; for in spite of the professions of "men of high principle" the noble Lord holds that when "evil spirits invoke force for the prosecution of their purpose, and the struggle is thus joined in the physical arena, it is only by force on the battle-ground thus chosen that the evil can be resisted." This will no doubt convince most readers as it must have convinced most if not all the listeners.

In this little book *Labour under Nazi rule* Mr. William A. Robson deals with the important changes that have lately taken place in the position of labour under Nazi rule. A machinery has developed for the regimentation of labour: the Confidential Council, the Labour Trustees, the Social Honour Courts etc. No doubt the Nazis have considerably reduced unemployment, but at a high cost to the labourer's position and happiness. Mr. Robson shows that the industrial control in a free country like Britain even in war time is bliss when compared to the enslavement of labour under Nazi rule.

P.J.T.

The role of Russia in the present tangle is very clearly set forth by Miss Barbara Ward in *Russian Foreign Policy*. Promotion of the Communist Revolution and her own security have been the dominant and alternating aims of Russian policy. When the world declined to respond to the revolutionary appeal, Russia under Stalin, has entered upon the relentless pursuit of security. After Versailles, Russia's need for German technical help and Germany's need for Russia as the practising ground of military arts forbidden on her own territory brought them together. The rise of Hitler and his anticomintern policy brought on a change, and Russia joined the League and befriended the democracies. But the ruling classes of England and France had not yet recognised Fascism in its true colours, and deeply hated Communism, witness Spain and Munich. Russia stands alone and pursues her own security; she will not take sides in any decisive manner, but take all possible advantage of the preoccupations of other powers, and still hope for the spread of

Communism in Europe as the effect of War and privation. But what her policy 'will bring, not even Russia knows.'

K.A.N.

The Nazis have persistently spread the report that Germany did not suffer a military defeat in 1918, but was weakened by the blockade and betrayed by traitors. This contention is met, with not a little ability by Captain Cyril Falls in *Was Germany Defeated in 1918?* The author tries to show how the German military and naval situation had become untenable by the beginning of November 1918. He himself has to recognise the naval mutiny at Kiel and the possible spread of Bolshevist influences; he holds also that "To reach the kernel of reality we may, however, disregard to a great extent academic discussions of why and wherefore. In a modern authoritarian state revolution may be considered to be the inevitable accompaniment of defeat; one may almost say that revolution and defeat are one." In the light of such statements one wonders whether the dividing line is not rather thin between what the Nazi claims and the Anti-Nazis prove. The narration of events, however, is masterly and will certainly interest readers not familiar with the entire ground.

ĀNANDARANGA PILLAI; THE 'PEPYS' OF FRENCH INDIA.

By Rao Saheb C. S. Srinivasachari, M.A., Professor of History and Politics, Annamalai University.

This valuable book is a welcome addition to the rather sparse literature concerning the doings of the French in India and their attempts to establish an empire in Hindustan. The learned author, who is a Professor of repute, a scientific scholar and historian who is so well-known to the students of British Indian History has prepared a most useful and well-written history of the period of French connection with India basing his narrative upon the entries in the Diary maintained by Ananda Ranga Pillai, a *courtier* under Dupleix and a big merchant of Pondicherry, who richly deserves to be called the 'Pepys' of French India as his observations on the general conditions of his time bearing upon all aspects of life, political social and religious are on a par with and even more valuable on the political side than those of Pepys on the social life of the age of Charles II of England.

The value of the Diary lies in its being the most reliable record of the day to day happenings in the Carnatic and the Deccan in the

middle of the 18th century A.D. The period required such a diarist to chronicle the events of far reaching importance which took place in such quick succession reflecting the unsettled character of the governments of the day. The Diary extended from 1736 to 1760 with lacunae in a few places covering short periods. It may be hoped that these lacunae will be filled up on an examination of the transcript of the Diary preserved in France which, thanks to the efforts of the savant Prof. G. J. Dubreuil, has been brought to light.

In presenting the historical matter contained in the Diary in the present form, the author has adopted a plan which is characteristic of a sound historical production based upon scientific research. While the entries in the Diary are woven into a continuous narrative, in the body of the book, the author has in his own long and scholarly footnotes, amplified many observations of the Diarist so that the future scholar who handles the book can assess accurately the contributions made by Ananda Ranga Pillai to the history of the period, deriving much benefit from the author's study and research embodied in the notes.

In the introductory chapter Prof. Srinivasachari gives a detailed account of the discovery of the Diary revealing several facts not known hitherto.

The period covered by the Diary (1736-1760) is one of the most momentous periods of South Indian history during which the French under Dupleix, whose *courtier* Ananda Ranga Pillai was, tried to establish an empire in India and to this end involved themselves in the affairs of the local princes and potentates, chiefly the Nizam and his subordinate Nawabs of Arcot, Cuddapah and Kurnool, the Maharattas and the rulers of Mysore, Tanjore and Trichinopoly. They came into conflict with the English, who, although solely interested in trade and commerce in which they were competitors with all other European powers who were then trading in the East, were however drawn into the whirlpool of politics and political strife.

This triangular contest among the native powers, the French, and the English, forms the subject matter of this book which runs into twenty chapters. The first four chapters contain an account of Dupleix's successful attempts to capture Madras from the English in which he had to employ the services of an unruly subordinate La Bourdonnais, the Commander of the fleet. The Diarist's observations on the quarrel between the two officers are enlightening. The subsequent chapters upto chapter XIII describe the two civil wars, the one in the Carnatic between Chandā Sahib

and Anwaruddin and his son Muhammad Ali, and the other at Hyderabad between Nazir Jung and Muzaffar Jung in which the French and the English supported the opposing claimants so that the struggle that developed later was transformed into an Anglo-French duel for supremacy in South India. These events though familiar to the student of British Indian History are however described in the book in an illuminating manner with great wealth of detail and with copious footnotes of which those on the contemporary Mahratta history (pp. 155-6) the site of Nazir Jung's murder (pp. 190-2) and on the 72 Pālaigars of South India (p. 201-5) are among the most interesting. Chapters XIV and XV relate to the governorships of Godeheu and De Syrit under whom the Diarist received scant respect and regard in contrast to the high dignity and honour which he commanded under Dupleix. The last few Chapters trace the concluding phase of the French struggle for power, the successes and failures that attended Bussy in the Deccan in his relations with the Nizam and the Mahrattas, the brief spell of power he enjoyed at Vizianagaram, Bobbili and the Sarcars, and the final collapse of the French under Lally.

There is at the beginning of the book a photograph of the Diarist taken from an oil painting. A map, an exhaustive bibliography, and an analytical index at the end enhance the usefulness of the book.

N.V.R.

THE EARLY HISTORY OF CEYLON. By G. C. Mendis, Ph. D. (The Heritage of Ceylon Series). Y.M.C.A. Publishing House, Calcutta (1940). Fourth Edition—revised and enlarged. Price Rs. 2.

This is the fourth edition of the book in a revised form. There are five chapters, the first of which deals with the early settlers and the introduction of Buddhism. This chapter begins with the life and traditions of the Vaddas, the primitive tribes of Ceylon. It is said that the Aryan immigrants were the first to introduce the system of village government, *Ganasabha* which persists to the present day. That the Dravidians too helped to form the Sinhalese race is also accepted. It is refreshing to note the remark that the word 'Dravidian' does not represent a distinct race but like the word 'Aryan' is a convenient label to designate those who speak Dravidian languages (p. 10). In the second chapter the contact of Ceylon with India, and the impact of Indian culture are explained.

The succeeding chapter is devoted to the early mediaeval period, from A.D. 362 to 1017, the year of the Cola conquest of Ceylon. During this period there were three political divisions, the northern region with Anurādhapura as capital, the south-eastern region called Ruhuna and Malayarata in the centre. Most of the kings of this period belonged to the two clans—the Moriya and Lambakarna. The growing interest in Buddhism and the influence of Sanskrit led to much literary activity. The Sinhalese language took its modern form during this period largely influenced by Pali and Sanskrit. In fine arts we find more the influence of South India, especially the Pallava. In 1017 the capital was shifted to Polonnaruva. The Cola ascendancy which continued for a length of time was put an end to by Vijayabāhu I of Malayarata. But it was Parākramabāhu who made extensive conquests and improved the administration in many ways. He was also a patron of Buddhism. After him there was the Kalinga dynasty. But no king of this period seems to have encouraged Sinhalese compositions. The tradition was still in favour of Pali. The next remarkable period in its history was from A.D. 1232 to 1500, the year of the arrival of the Portuguese in Ceylon. In this period the relations of Ceylon with South Indian empires of Pāṇḍya and Vijayanagara are traced. What is important is the establishment of a Tamil kingdom in the north of the Island and the drift of the seat of Sinhalese government to south-east. The book is well illustrated and contains a number of useful maps.

V. R. R.

HOW INDIA IS GOVERNED. By N. S. Pardasani, M.A. (New Book Co. Rs. 3).

In recent years there has been a notable increase in the number of books written on the subject of the Indian Constitution. This has, no doubt, been partly due to the British government's declaration after the last war that it was its intention to lead India up the path of constitutional progress. The rise of Fascism has also produced many attempts to re-evaluate constitutions and constitutional methods which have had their repercussions in India. And the Congress demand for a Constituent Assembly has raised constitutional issues which are of vital interest to the whole nation.

These books are a help to the student who would otherwise have to spend valuable time scouring through voluminous reports

and acts of parliament. But it is rarely that they are written in a style which makes them understandable to the ordinary layman. Mr. Pardasani's book is praiseworthy as a comprehensive survey of the Indian constitution and administration in language that is clear and simple.

Before launching on an examination of the existing and projected institutions Mr. Pardasani gives a rather brief outline of the country's constitutional history from the days of Company rule to the resignation of the Congress ministries in November 1939. Then he gives a detailed account of the central legislative and governmental organs both under dyarchy and the proposed All-India Federation in the India Act 1935. Quite naturally much attention is given to the federal scheme and there is a valuable chapter devoted to a critical estimate of its worth. The Provincial constitution is ably surveyed and followed by a useful chapter on the way it worked in practice. The rest of the book is given to an examination of the administration. Such varied topics as federal finance, home government, justice, education, land revenue, police and jails, and even famines are fully discussed.

The title of Mr. Pardasani's book will remind the student of that well-known work by Ramsay Muir "How England is governed." But they are unlike each other in that this is obviously much more of a straight-forward text-book. Mr. Pardasani does not indulge in too much speculation as to what social forces are at work behind the constitution. His aim is to examine and criticize the constitution and this he does efficiently in a running commentary which shows careful judgment and considerable scholarship. It is an extremely valuable handbook for all those who wish to have a real understanding and a true perspective of how the country is governed and can be recommended to student and layman alike.

E. A.

THE HOME LIBRARY CLUB. *Great Men of India*, price Rs. 5-8-0.
Modern Scientific Thought, price Rs. 4-14-0.

The Home Library Club (*Times of India*, Bombay) is making available to its subscribers an excellent set of volumes both specially contributed and reprinted. We have here one of each class.

The Great Men of India is a series of short but fairly full account of Indians of note, past and present. The book is divided into eight sections—Rulers and Great Leaders (from Chandragupta Maurya down to the present ruler of Bikaner), statesmen and politi-

cians (mostly contemporaries like Malaviyaji, Mahatmaji and Jinnah), reformers and religious teachers (from Gautama Buddha to Vivekananda), authors and poets (from Kalidasa to Tagore), scientists (Bose, Raman, Ray), educationists (Sir Syed Ahmad and Sir Asutosh Mookerjee), judges (Sir Shah Sulaiman) and industrial pioneers (J. N. Tata). The collection is representative. Even a volume of 640 pages cannot but leave out some important names. It is a pity for instance there is no account of Sri Aurobindo, though there is a biography of his influential Chela, Sir Akbar Hydari. There have been South Indian Judges of some eminence, and at least one Judge of marked ability as a Jurist—Sir V. Bhashyam Aiyangar. It is also a pity that the volume or the scheme of classification finds no room for Sir S. Radhakrishnan, the *liaison* officer between East and West. Despite these omissions, perhaps inevitable in any such collection, the accounts are sparklingly clear, vivid and sympathetic. Among the special successes in the volume may be mentioned the notices of Tilak, the three Indian Scientists (all from one pen, that of the present Director of the Tata Institute), Sankaracharya and generally the notices written by the late C. F. Andrews. The profuse illustration of the volume is another feature of great attraction. We trust it will find a place in every library, private or public.

To the second class belongs *Modern Scientific Thought*, containing four books. The first of these is the well-known *Mysterious Universe* of that wizard of astronomical exposition—Sir James Jeans. Though reprinted more than once, the reading public interested in science, but not expert in it, can never have too much of this fascinating account leading up to the concept of “the Great Architect of the Universe.....as a pure Mathematician”. The second book on *Animal Biology* is contributed by two distinguished biologists, J. B. S. Haldane and Julian Huxley. “This brief sketch” (about 270 pages, including numerous plates and illustrations, and excluding a very useful glossary) “will perhaps give some idea of the strange series of processes, many of them apparently unconnected, which have yet been necessary for human beings to arise, and for mental activity to become the controlling factor in evolution.” The authors never relax their grip on the reader’s attention. That popular exponent of Philosophy—Prof. C. E. M. Joad—gives us in some sixty pages a narrative of the *Mind and Its Workings*. Starting with a brief statement of the mind-body problem, the author discusses the views (like behaviourism) which treat mind merely as an aspect of the body, and passes on to the

views which consider mind to be distinct from and independent of body and brain. The mind is not a composite of various faculties, but "an active dynamic synthesising force", an ocean in which waves are distinguishable, but not separable. There is no justification for separating reason from instinct, or emotion from cognition and conation, or the conscious from the unconscious. To disparage the psychology of the unconscious is not, however, to belittle the value of psycho-therapy through analytic methods. Professor H. Levy of London University contributes ten chapters on the *Art of Thinking* in various aspects, e.g. metaphysics (determinism and free-will), art and values, political principles, etc. Prof. Levy is not one of those who believe that the principle of uncertainty has dealt a death-blow to determinism. He holds that the true thinker like the perfect artist and the great man of action would miss no detail but would see them all against the shifting background of history; most of Prof. Levy's readers will subscribe to this position though they may dissent from his own conclusions. This is an altogether stimulating and indispensable volume. There is a very useful index at the end for all four books.

REVISION OF DEMOCRACY by A. Appadorai, M.A., Ph. D.,
Humphrey Milford, 1940; pp. 74; price 12 annas.

This little booklet comprises two lectures delivered by Mr. Appadorai (of Loyola College, Madras) as extension lectures in the University of Mysore. The titles are the Idea of Democracy and the Institutions of Democracy. Dr. Appadorai is a sympathetic critic with a faith in democracy and a desire to save it. His vision is clear and his outlook sober, such as is worthy of a democrat; for this system of government bases itself on "discussion, gradualness and appeal to reason." While alive to the defects of democracy, he naturally holds that "if, after careful experiment, education fails in its objective, democracy will have to be pronounced a failure; but until then, perhaps it is better to suspend our judgment" (p. 27). The difficulty is to secure the conditions of this "careful experiment." Both politicians and psychologists see in man no longer the reason-dominated animal; at his best as well as at his worst he seems to be at the mercy of instincts and passions which defy the logically formulated programmes of democratic educators. If the recognition of this non-rational nature of man "only makes it more urgent to guide the instinctive disposition of man" (p. 26) we are within measurable distance of Führer-

dom and the negation of democracy. And "if economic tendencies are altered by the very fact that we study them" (p. 71) that would seem an admission of relativity fatal to any absolutism as to fundamentals, even those of democracy. The virtue of democracy is its apotheosis of personality; its vice is the conception of personality in the plural, as finite and as identifiable with you and me. While conserving the merit, we have to eradicate the defect; in the process we may have to make terms even with Communism instead of suggesting that "a true theory of politics depends above all on the rejection of communism" (p. 21). Democracy is not the last word in politics any more than reason is in personality. Dr. Appadorai is young, wise and vigorous; let us hope that he will be one of those to help us to a clearer political vision in the future.

THE NUMBER OF RASAS by Dr. V. Raghavan ; Adyar Library, Madras, pp. 192; 1940; price not stated.

Dr. Raghavan is known as a thorough student of *Alaṅkāra-śāstra*. The present work comprises ten chapters, the central theme being the number of rasas recognised by Bharata, the inclusion or non-inclusion of *śānta* in these, the distinctive *sthāyin* of *śānta* if recognised and so on. The author holds that Bharata himself reckoned only eight rasas. There seems to be little difficulty, however, in justifying the inclusion of *śānta-rasa*, even if this was later than Bharata's day. As both the author and Mr. Hirianna in his foreword point out, the practice of great poets "shows that *śānta* situations can certainly be delineated in literary works" (p. vii). Perhaps, it is also true, as Mr. Hirianna holds, not that *śānta rasa* appeals to fewer people, but that only the few can capture and cultivate it (p. viii). One wonders, however, if this position marks much advance on the other in saving the right of *śānta* to recognition; for lack of capacity to capture is not far different from lack of appeal. Perhaps a more satisfactory note is sounded by Abhinavagupta who, unlike other advocates of *śānta*, held that the *ātman* itself is the *sthāyin* of *śānta*; this *ātman* "is *sthāyin par excellence*" (p. 86). On such a view, *śānta* would be not one rasa added to others, but the supreme rasa which is in all others and is yet more than they; it is immanent and yet transcendent; it is *parā-pararahasyayogini*, for that reason, located by the *śākta* in the supreme abode, the *bindu* itself. *Śānta* therefore appeals to all; but it is not realised by all as the appeal of *śānta*, being confounded

with one or more of its lower manifestations. An approach on such lines may perhaps render even more valuable Dr. Raghavan's already interesting chapter on rasa-synthesis. Perhaps the almost complete absence of tragedy from the Indian drama may also find some explanation here. As it is, his discussions are able, clear, and sympathetic; and the book will be prized by all readers interested in the philosophy of aesthetic appreciation.

UPPER SCHOOL ALGEBRA: Being an Abridged and Revised Edition of Hall and Knight's Higher Algebra. By L. Crossland, M.A., B.Sc., (Macmillan & Co., Ltd., London) 1940, pp. xv and 292.

The book under review is an offspring of the famous Hall and Knight's *Higher Algebra*. The parent book itself had its birth in 1887 and was largely used for a number of decades by students of Algebra in the Intermediate and B.A. classes in our colleges. It has now been mostly driven out of the field, by recent books with a modern air about them. The treatment of topics such as ratios, commensurables and incommensurables, limiting values, vanishing fraction, convergency and divergency of series, in Hall and Knight's book has the early nineteenth century touch about it. Nevertheless, the book is still valuable on account of its collection of exercises.

L. Crossland has brought out this diminutive edition of Hall and Knight, mainly for the use of nonspecialists offering mathematics as one of a group of three or four subjects for the Higher School Certificate Examinations of various British examining bodies.

The book claims to be an Abridged and Revised edition of the parent volume. It certainly is a considerably abridged edition, containing only 292 pages against the 557 of the original. Many chapters such as those on scales of Notation, Multinomial Theorem, Recurring Series, continued Fractions (Simple, Recurring and General), Indeterminate Equations, Theory of Numbers, Probabilities, and Determinants, have been omitted altogether. On most of the remaining chapters, the axe has been applied to varying extents; the chapters on Convergency and Divergency, Interest and Annuities, Inequalities and Summation of Series have fairly big slices taken off them. The last chapter *viz.*, "Miscellaneous Theorems and Examples" is a piecing together of portions of the last two chapters of the original volume.

While thus the abridgment is quite prominent, the other process, *viz.*, revision, is not in evidence, unless the rearrangement of some of the chapters can be claimed to be revision. In any revision of the parent book, one would expect to find the old-fangled treatment, referred to above, of rates, commensurables and incommensurables, limiting values, and convergency of series replaced completely by a correct and up-to-date presentation; but one is sorely disappointed to find in a book printed in the year of grace 1940, that "an infinite series is said to be convergent when the sum of the first n terms cannot numerically exceed some finite quantity, however great n may be" [§164, p. 138]. The addition of "and if the terms decrease indefinitely" [§167, p. 139] at the end of the proposition: "An infinite series in which the terms are alternately positive and negative is convergent if each term is numerically less than the preceding terms" [Hall and Knight: p. 280 § 280] is revision indeed!

G.A.S.

ODD NUMBERS OR ARITHMETIC REVISED : By Herbert McKay (Cambridge, University Press) 1940 pp. 215.

This is an interesting little book, written in a simple style. Its study will cure the aversion for figures produced in most of us by faulty arithmetic teaching which creates the impression that arithmetic means dull and purposeless manipulation of numbers. This book shows how a study of numbers may be made pleasant and stimulating; it sets out a few of the interesting things "that cry out for arithmetical treatment." It does not employ anything more than the elementary processes of algebra, the definitions only of the trigonometrical ratios and the mere concept of similar figures in geometry.

Chapter I introduces the reader to some large numbers like the measures of astronomical distances and masses, and helps the comprehension of their astounding vastness. In Chapters II and III a simple account of negative and fractional indices is given, leading to the clear understanding of the meaning, construction and use of logarithms. The next three chapters are devoted to the use of proportion in the representation and comparison of large magnitudes. The use and abuse of averages and approximations form the subject matter of chapters VIII and IX. In chapters VII and XII, the author discusses the various systems of units and puts forth a laboured defence of the English system as against the metric system based on the decimal scale which is subjected to a severe

condemnation. There is an interesting chapter relating to the construction and solution of some arithmetical problems. It is a book which every person should read. It is of special appeal to teachers of arithmetic desirous of infusing life into their teaching.

G. A. S.

THE SILAPPADIKARAM, OR 'THE LAY OF THE ANKLET'

By Mr. V. R. Ramachandra Dikshitar, M.A., Lecturer in Indian History and Archaeology, University of Madras, Oxford University Press, 1939; price Rs. 15.

This is a quite delightful almost literal rendering into English of the great ancient Tamil epic, the *Silappadikaram*.

Mr. Dikshitar's service to Tamil this time is unique for *Silappadikaram* occupies a unique place among the ancient Tamil classics now extant. The heroine is a daughter of the Tamil land, and the divineness of feminine fidelity is the prominent theme of the long and majestic poem. More than this, it is the only poem from which we can now have some idea of the old Tamil Dramatic and Musical compositions which are now entirely and perhaps irretrievably lost.

This valuable work, however, had long been a sealed book to almost all English-educated Tamils. Even among the Tamil scholars, there have not been many who could understand the poem as a whole, for its old glossary is too meagre, and its later commentary is not fully available.

Mr. Dikshitar has now given to the English-knowing Tamil world,—nay, to the whole world, the inimitable *Silappadikaram*, by translating it into the world-language.

To translate a long ancient Tamil poem into English is surely no easy work, inasmuch as Tamil greatly delights in ellipses, and great scholars themselves differ in construing many a passage. So the translation must have cost the author much labour and judgment.

This will ever be a memorable work of Mr. Dikshitar, and will never fail to do honour both to himself and to the Tamils.

And this excellent work may well be commended to the notice of all who are interested in the Tamils and their history and literature.

S. D. Sargunar.

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L. P. Thompson: *Can Germany stand the Strain?* (Oxford University Press).

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A. G. B. Fisher: *Economic Self-Sufficiency.* (Oxford University Press).

Geofrey Crowther: *Paying for the War.* (Oxford University Press).

A. J. Mee: *Higher Chemical Calculations.* (Macmillan & Co.).

Bhavayya Chaudhari: *History of the Kammās, Part II.*

The Journal of the University of Bombay, Vol. IX, Parts 2 & 3.

The Bombay University Bulletin, Vol. I. Nos. 1 & 2.

The New Review, Nos. 67, 68, 69, 71, 72 & 73.

The Journal of the Benares Hindu University, Vol. V. No. 1.

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The Journal of the Sind Historical Society, Vol. IV, No. 4.

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Recent advances in our knowledge of the upper cretaceous and lower Eocene beds of India, with special reference to the cretaceous Eocene boundary, by L. Rama Rao, M.A., F.G.S., F.A.Sc., F.N.I.

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NĀLANDĀ

By

K. A. NILAKANTA SASTRI,

The Mine of Learning, honoured Nālandā

—*Tāranāth*.¹

Early References

Nālandā, the modern Bargaon (Skt. Vāṭa grāma, village of banyan trees),² figures fairly prominently in the early Jaina and Bauddha literature.³ From the Jain books we learn that Nālandā was a prosperous suburb (*bāhiriya*) of Rājagṛha and that Mahāvīra spent fourteen cāturmāsya (period of rest in the rainy season) there. Nālandā is at a distance of seven miles from Rājagṛha, and the Buddhist works treat of them as two different places, and often speak of the country between them—*antarā ca Rājagāham antarā ca Nālandam*. These works also state more than once that the Buddha and Mahāvīra both visited the place at the same time, and that a mango park by name Pāvārika was the usual spot of the Buddha's sojourn whenever he visited the place. And the *Mahā-parinibbānasūta*⁴ says that the Buddha, followed by a great number of disciples, turned his steps towards Nālandā on his last journey. Nāla-grāma, the place of the birth and death of one of Buddha's chief disciples, was doubtless identical with Nālandā;⁵ and the village where Maudgalyāyana, another celebrated disciple, was born, was also in the neighbourhood.⁶

1. *Geschichte*, p. 152.

2. Bosch suggests a possible derivation from the name of Maṇivāṭaka, one of the five villages presented to the Bālaputra monastery, TBG, lxvi (1925), p. 569, n. 101.

3. The passages have been collected together by Dr. Hirananda Sastri—*Proc. Fifth Or. Conf.* pp. 386-400.

4. I, 15-18.

5. *Sudassana Jātaka*, SBE, xi, p. 238.

6. Beal, *Life of Hiuen-Tsang*, p. 105. Also, Watters, ii, 171.

The Name

Of the name Nālandā and of the mango grove in it where the Buddha sojourned whenever he went there, Hiuen Tsang narrates the following legend:⁷ 'The tradition was that in a mango wood in the south of this (Nālandā) monastery was a tank the dragon of which was called Nālandā and that his name was given to the monastery. But the facts of the case were that Ju-lai as a P'usa had once been a king with his capital here, that as king he had been honoured by the epithet Nālandā or 'insatiable in giving' on account of his kindness and liberality, and that this epithet was given as its name to the monastery. The grounds of the establishment were originally a Mango Park bought by 500 merchants for ten *koṭi* of gold coins and presented by them to the Buddha.' Hiuen Tsang thus implied that the monastery of Nālandā rose later on the spot of the mango grove hallowed by the presence of the Buddha on so many occasions.

Hiuen Tsang thus rejects the derivation of the name of the monastery from that of the dragon or serpent inhabiting a tank in the grove, and prefers to associate it with the limitless charities of the Buddha in a former birth as king; Chavannes notes that this name *na-alam-dā*, 'giving without tiring,' or 'that which has not enough of giving', is due, according to certain Chinese authors, to the magnificent donations that the foundation received successively from five princes,⁸ of which more presently.

The biographer of Hiuen Tsang narrates all the legends mentioned so far, and adds some new details regarding the original owner of the site of the monastery which shows that we have here a legend which is growing by progressive exercises in euhemerism; the site is no longer a mango grove, but the garden of a śreṣṭhin by name Āmra, and the five hundred merchants who gave the money for purchasing the garden for the Buddha got their reward duly and became arhats. Here is the account of the pilgrim's biographer: "The Nālandā monastery is the same as the '*charity without intermission*' monastery. The tradition of the old people is this:—To the south of the convent, in the middle of an Āmra garden, is a pool. In this pool is a Nāga called Nālandā, and the convent built by the side of the pool is therefore called after his name. Again there is a saying that Tathāgata whilst a Bodhisattva was the king of a great country and built his capital in this place. He was deeply affected towards the orphans and destitute,

7. Watters ii, 164. Ju-lai is Tathāgata, i.e., Buddha; P'usa is Bodhisattva.

8. *Rel. Em.*, p. 84, n. 2.

and, ever moved by this principle, gave away all he had for their good. In memory of this goodness they named the place '*doing charitable acts without intermission.*'

"The place was originally the garden of the lord (*Śreṣṭhin*) Āmra (or, *Amara*). Five hundred merchants bought it for ten lacs of gold pieces, and presented it to Buddha. Here Buddha preached the law for three months, and most of the merchants obtained the fruit of Arhatship, in consequence."

I-tsing adheres to the story of the serpent, and says: "This is the model of the *Che-li-Na-lan-t'ouo Mo-ho-P'i-ho-louo* (*Śrī Nālandā-mahā-vihāra*).⁹ Translated into Chinese this name signifies: 'the happy great residence of the holy serpent.' In the countries of the West,¹⁰ when they speak of a king or of some high functionary or of the buildings of a great temple, they always prefix the particle *che-li* (*Śrī*) of which the sense conveys the idea of happy and fortunate. *Na-lan-t'ouo* (*Nālandā*) is the name of a serpent; near about there, in fact, there was a serpent which had the name *na-kia-lan-t'ouo* (*Naga-Landa*). It is from that that this name is derived. *P'i-ho-louo* (*vihāra*) has the sense of residence; those who say 'temple' do not make an exact translation."¹¹

Origin

The actual date of the foundation of the *vihāra* is not easy to ascertain. Fa-hien's silence regarding it has been the basis of the oft-repeated inference that the *vihāra* came into existence only after the period of his travel in India. But this may very well be doubted, because both Hiuen Tsang and I-tsing assign, as will soon be evident, a much higher antiquity to it, and so does the much later and less dependable Tāranāth. Fa-hien's silence—if indeed Fa-hien is silent¹²—can be taken only to indicate that the place had not yet attained fame as the most celebrated centre of learning in India. For the numerous references to *Nālandā* in the Buddhist

9. The plan is missing.

10. West of China.

11. *Ib.* pp. 93-4.

12. Watters, ii, 165 indeed says like many others that Fa-hien does not even mention *Nālandā* by name. I find, however, that Giles' translation contains this at p. 49: '*Nālandā*, the village where *Śāriputra* was born and to which he returned to pass away. Here a pagoda was raised, which is still in existence.' Legge allows the possibility also. Bosch (p. 547 n. 61) holds that Fa-hien's *Nāla* is not the same as *Nālandā*, but a place at some

canonical books show that long before the visits of Hiuen Tsang and I-tsing to the great monastery several memorials must have come up to preserve the memory of the spots in the neighbourhood where the Buddha and his disciples had lived and taught, and that these 'gandhakotis' must have been visited by numerous devotees in the course of their pilgrimages in the holy land. In fact the accounts of the two Chinese pilgrims who have most to tell us about Nālandā leave little room to doubt this; but it is more difficult to decide when Nālandā became a cloister and a college with several halls of learning, the chief centre of Buddhist scholasticism that we find it in the seventh century and later. The third or fourth century A.D. or even an earlier time may well be suggested as the period of the commencement of that growth on the intellectual and educational side which in course of time made it the richest and the greatest centre, not only of Buddhist lore, but generally of all learning in India,—in the entire world.

Archaeological evidence does give some support to our view of the antiquity of Nālandā. The exact structure of the main stupa, it has been shown, was remodelled no less than six times after its original foundation, and the fourth remodelling, 'the most interesting and the best preserved,' had corner towers of which three have been exposed; by their beautiful stucco figures of the Buddha and the Bodhisattvas on them, and by the inscriptions of Buddhist texts on bricks found in the core of votive stupas, we may infer that this remodelling took place some time in the sixth century A.D. "Considering the huge accumulations upon which the fifth stupa was built, it seems that the foundation of the original stupa must have been laid about two centuries earlier".^{12a} The date suggested is approximate; it may be earlier. And there is the possibility that even the core of the extant structure replaced some earlier form of which we have no knowledge.

Early History

Let us see what the pilgrims themselves have to say on the early history of the place. And first, Hiuen Tsang :¹³ "Here soon

distance from it, and accounts for Fa-hien's silence *re* Nālandā by supposing that like many other places it was deserted at the beginning of the fifth century when the strong wave of Hindu revival under the Guptas affected Buddhism adversely everywhere in Northern India. I am unable to share this view of the position of Buddhism in the fifth century.

12a. A. Ghosh, *A guide to Nālandā*, p. 3.

13. Watters ii, pp. 164-5.

after the decease of the Buddha, Śākrāditya, a former king of this country, esteeming the one vehicle and reverencing the Three Precious Ones, built a monastery. This king's son and successor Buddhagupta, continuing his father's good work, to the south of the monastery built another one; to the east of this king Tathāgata-gupta built a third monastery; and to the north-east of this king Bālāditya added a fourth. At the formal opening of this last monastery Brethren from all quarters were present by invitation of the king, and among these strangers were two who said they were Chinese. When the king went to visit these latter, they had disappeared in a mysterious manner, and His Majesty was so affected by the incident that he abdicated and joined the Buddhist fraternity (in the monastery he had built). The rule of seniority placed him below all the Brethren, and he did not like this change in his social position. He put his case before the ordained brethren who thereupon made a rule that members of the establishment who were not fully ordained should rank according to age, a rule which is found in this monastery and in no other. To the west of the monastery Bālāditya's son and successor Vajra built another; and to the north of this a king of Mid-India afterwards erected a large monastery. Then round all there was built a lofty enclosing wall with one gate."

The *Life of Hiuen Tsang* also gives more or less the same details; its account of Bālāditya and the priests from China is much more intelligible than the unresolved mystery in the pilgrim's own account, for we read in the *Life*: 'Bālāditya built a Saṅghārāma to the north-east. Afterwards the king, seeing some priests who came from the country of China to receive his religious offerings, was filled with gladness, and he gave up his royal estate and became a recluse.'

I-tsing gives a much briefer account, but adds some fresh data regarding the beginnings of the foundation. He says: 'More than seven yojanas to the north-east of the temple of Great Intelligence (Mahābodhi) we come to the temple of Na-lan-t'oulo (Nālandā). It was formerly constructed by the king Che-li-Che-kie-louo-tie-ti (Śri Śākrāditya) for the pi-tch'ou (bhikṣu) Ho-louo-che-p'an-che (Rājavarṇa) of Northern India. This temple, in its original area, was only a square of fifty feet; later, the kings that succeeded vied with one another in extending it more and more, so that to-day there is no temple more beautiful than this in all Jambu-dvīpa'.¹⁴

14. *Rel. Em.*, pp. 84-5.

Hiuen Tsang also ascribes the foundation to Śakrāditya, but does not say anything of Bhikṣu Rājavamśa or of the original size of the temple.

Critique

Can we identify the monarchs mentioned in Hiuen Tsang's account viz., Śakrāditya, his son and successor Buddha-gupta, Tathāgatagupta, Bālāditya, Vajra, the son and successor of Bālāditya, and lastly the king of Mid-India? It seems that we may well be sure of the identity of Bālāditya. He was doubtless the Gupta king Narasimha Gupta, the pupil of Vasubandhu and the enemy of Mihirakula. And so far as I know, Satischandra Vidyabhushan was the first to treat the names preceding Bālāditya as those of three successive generations of his predecessors, and suggest A.D. 450 as the probable date of Śakrāditya's rule.¹⁵ This line of argument was taken up again in 1928 and developed in much greater detail by Father Heras in his memoir on *The Royal patrons of the University of Nālandā*,¹⁶ placing the foundation of Nālandā in the year A.D. 427 some years after Fa-hien's travels in India. These views have since been adopted by other writers though with minor variations that we need not stop to discuss.

Let us see what can be said in their favour. Though Vidyabhushan and Heras have not said so, I think they were influenced largely by the narrative of the early history of the monastery by the biographer of Hiuen Tsang; for though the pilgrim himself says nothing about the intervals or the relations between Buddha-gupta and Tathāgatagupta, and between Tathāgatagupta and Bālāditya, his biographer does make the first five kings in the list (Śakrāditya to Vajra) succeed in a regular line, the son succeeding to father in every case, and after mentioning the king of Mid-India as the sixth, he definitely says: 'Thus six kings in connected succession added to these structures.' I must hasten to add, however, that though Hwui Li's account has suggested the idea of continuous succession of the rulers, his account of the relationship among them has not been followed by Heras, who adheres to Hiuen Tsang's indications in this regard and finds that they tally with the facts of Gupta history. Thus his scheme of identifications is like this:

15. *Mediaeval Logic* (1909), App. A.

16. JBORS xiv, pp. 1-23. See also Kimura, *Shifting of the centre of Buddhism in India*.

*Hiuen Tsang**Gupta History*

Śakrāditya

Kumārāgupta I

Buddha-gupta, son and
successorSkandagupta, son and suc-
cessor of Kumāra.

Tathāgatagupta, successor

Puragupta, brother (not
son) and successor of
Skanda

Bālāditya, successor

Bālāditya, (son and) suc-
cessor.

Other considerations urged in support of the scheme may be summed up thus : Śakra is the same as Mahendra, the Āditya title of Kumārāgupta I. Again, the father of Bālāditya was Puragupta (Vikramāditya) who sent his son to Vasubandhu for his education and had therefore Buddhist leanings; clearly he could be referred to as Tathāgatagupta on that account. Further, the time of Kumārāgupta, heir to the high intellectual tradition of the nine gems of Vikramāditya's court was eminently suited for the foundation of the University ; the Gupta empire was at its zenith, and Kumārāgupta himself is known (from a reference to him in Vāmana's *Kāvya-lankāra*) to have been a patron of letters; how best could the title have been earned but by the foundation of Nālandā ? He was perhaps no Buddhist himself, but surely a respecter and promoter of the creed and its institutions.

By themselves these considerations appear plausible and they seem to contain the elements of an intelligible story of the development of Nālandā. But there are a number of considerations on the other side which seem to put the whole matter back in the region of doubt and uncertainty. Hiuen Tsang puts the reign of Śakrāditya 'soon after the decease of the Buddha'; his biographer is not so definite and says : 'After the Nirvāṇa of Buddha an old king of this country called Śakrāditya.....built this convent';¹⁷ but then he says elsewhere that Nālandā as a centre of learning had already existed for seven hundred years at the time he wrote (A.D. 688) ;¹⁸ and Beal has drawn pointed attention to this in a note saying that this implies two things : first that Śakrāditya must have lived about the first century B.C., and secondly that Hiuen Tsang's expression 'soon after the nirvāṇa' must be taken, *cum*

17. *Life*, p. 110.18. *Ib.* p. 112 and n. 2. See also n. 1, p. xx.

grano, to mean 'a good while after.' We may not be right to take this as a definite indication of Śākrāditya's date without further evidence of a more tangible character; but we can surely infer that both Hiuen Tsang and his biographer thought that the Nālandā of which they were speaking was of much higher antiquity than the age of Kumāragupta I. Tāranātha likewise speaks of Nālandā as dating from before Aśoka's time, of Aśoka's constructions there, and of the activity of Rāhula, Nāgārjuna and Āryadeva; all this may not be, perhaps is not, history; but it attests sufficiently the prevalent belief in the antiquity of Nālandā.

It is difficult to accept the view that Śakra should be taken to stand for Mahendra when we are dealing with the distinguishing titles of monarchs. Again, Vasubandhu's relation to the Guptas has been much debated. Vāmana in his *Kāvyālaṅkāra* distinctly says that Vasubandhu was the Counsellor of a son of a Candragupta, and that it was on this account that he was called the refuge of the learned—*āśrayaḥ Kṛtadhiyām*.¹⁹ Vidyabhushan accepts this, as also Paramārtha's statements regarding the discipleship of Bālāditya and the death of Vasubandhu in his reign at the age of eighty, and makes Vasubandhu a contemporary of four Gupta rulers, Kumāra I, Skanda, Pura and Narasimha, assigning him a life period from about A.D. 410 to about A.D. 490. Heras puts a more general construction on the praise of Kumārā Gupta in order to strengthen his claims to be the founder of the University; but this ignores the specific gloss of Vāmana whose comment must be presumed to be based on the context of his citation or on some living tradition on the subject. But quite other views have been taken, and Vasubandhu has been held to have been the contemporary of Samudragupta in the fourth century A.D.²⁰ The explanation offered for Puragupta being called Tathāgatagupta by Hiuen Tsang is by no means convincing, and no reason can be found why Skanda Gupta should be called Buddhagupta. It may be noted at this point that another reconstruction is offered by H. C. Raychaudhuri who equates Buddhagupta with Budhagupta, makes him the youngest son of Kumāra I (Mahendra, Śakra), and postulates a new branch of the Guptas.²¹ I do not think he has answered Fleet's objections to the identification of Buddha with Budha by the analogies he has cited, and I do not think there is

19. III, 2.2.

20. Smith, EHI, 4, App. N. pp. 346-7.

21. *Pol. His. of Anc. India*, pp. 501 and 506.

any evidence worth the name for the genealogy he offers though with an interrogation mark and dotted lines indicating its tentative character; he also postulates a second Bālāditya different from Narasimha and identified doubtfully with Bhānu Gupta. Such are the strange results of trying to read Hiuen Tsang's names into the evidence of the inscriptions. One more point. If Hiuen Tsang applied the name Tathāgatagupta to Pura-gupta for the reason put forward by Heras, why did he then fail to say that Bālāditya was the son of Tathāgatagupta?

Conclusion on early history

I think that it is really no use trying to get more history out of Hiuen Tsang than there is in him; Bālāditya is a real name; of him the pilgrim himself gives many other details in relation to the Hun invasions, and what he says on this subject as also the part of Bālāditya in the growth of Nālandā is fully borne out by epigraphy. The rest seems to be no more than just edifying gossip. Names like Śakrāditya, Tathāgatagupta and Buddhagupta are obviously legendary. It is well known that the pious pilgrim was credulous about whatever concerned Buddhism.

Of the two remaining kings mentioned by Hiuen Tsang, Vajra is identified by Heras with Kumāragupta II, though he admits that the name Vajra is not easy to explain; and the king of Mid-India with Harṣavardhana,—this in spite of the facts that Hiuen Tsang mentions this king of Mid-India amongst past monarchs, and refers later to the constructions of Harṣa as those of Śīlāditya still in progress while he was in India.

Our conclusion is that Bālāditya is the first truly historical name definitely known to be associated with the foundations in Nālandā; the identity of Vajra and the king of Mid-India who are mentioned after him is at present not clear. The earlier history is evidently a made up affair in which history has changed into legend as it does more often in India than elsewhere.²² But we have reason

22. It is perhaps worth while, in passing, to draw attention to some modern legends on Nālandā. In *A Note on the excavations of Nālandā and its History* (JBBRAS, NS ii 1926), pp. 214-6, and in the article on *The Royal Patrons of Nālandā* referred to above, Heras notes that the buildings in Nālandā are found built over earlier structures, and accounts for this by postulating that Nālandā was demolished and rebuilt more than once—first destruction by Mihirakula and restoration by Bālāditya who held a great assembly in commemoration of it; second destruction by Śaśāṅka followed by a restoration by Harṣa; perhaps a third destruction also in the

to think that Nālandā was older than Fa-hien's time and that he knew of it, though somehow he does not give a detailed account. It may be that, as already suggested, the *vihāra* had not attained such great celebrity at the beginning of the fifth century as it did later. It is not improbable that the Guptas patronised it, and much of the expansion of the place might have been due to this patronage, and the Gupta names of the monarchs mentioned by Hiuen Tsang may be a recognition of this general fact, though even of this we may not be quite sure as the names might have been coined in the mint of legend on the analogy of names of kings most familiar to people in the age of the Guptas. In any event, the details of the early history of the growth of Nālandā before the time of Bālāditya are hidden from view.

Epigraphic evidence

The importance of Nālandā in the early Gupta period is borne out by epigraphy. One of the seals recovered during the excavations there bears the inscription *Kumārāmātyādhikaraṇa*²³ in Gupta characters of the fifth century. This need not necessarily mean that Nālandā was the provincial headquarters, but it indicates at the least that some communication was made to Nālandā from such headquarters. An even earlier record is a copper-plate of the time of Samudragupta;²⁴ its genuineness has indeed been called in question, but apparently on insufficient grounds; this record mentions the *gopasvāmi* and the *akṣapaṭalādhikṛta* of the Nālandā village, and also other offices like *mahāpilūpati* and *mahabalādhikṛta*.

Growth

To return to the accounts of Hiuen Tsang and I-tsing. While the former counts only six *vihāras*, I-tsing saw eight of them.

wars of Ādityasena Īśānavarman. There is no support for all this either in Hiuen Tsang, our most detailed source for the period, or in Archaeology. Nothing is commoner than repeated reconstructions of growing institutions, and many stūpas are known to have been rebuilt over and over again without their having been destroyed in war. The actual occasions of destruction for which we have definite evidence will be noted in the course of this paper.

23. Bhandarkar's *List* No. 2103.

24. *Ib.* No. 2075 ; EI, xxv, pp. 50-3. A coin, archer-type of Kumāragupta (A.D. 413-55), and a clay mould of Gupta coins have also been discovered. —Ghosh, *op. cit.*, p. 10.

Hiuen Tsang records his impressions of the sculpture in the monasteries and temples and gives some details of particular vihāras. He says: "In this establishment, the work of a succession of sovereigns, the sculpture was perfect and really beautiful. In the monastery built by Śakrāditya, there is now an image of Buddha, and every day forty brethren are sent to take their food there to requite the bounty of the founder." Watters²⁵ comments on this as follows: 'It is probable that the Śakrāditya monastery was in ruins when Yuan-chwang visited the place, and that the forty brethren were sent from another vihāra to eat their breakfast at it, to keep the memory of its establishment and its founder. At I-ching's time there were only the foundations of this monastery visible.' He cites no authority for these statements, and I have not come across any.

Sacred Vestiges

That Nālandā stood on most hallowed ground is emphasised by Hiuen Tsang's account of the sacred vestiges round about the great vihāra and his record of the details of some of the miracles connected with them :

"All round the Nālandā establishment were 100 sacred vestiges of which two or three are to be briefly noticed. To the west was a temple at a place where the Buddha had lodged for three months and preached to devas and men, and above 100 paces to the south of this was a tope where a foreign bhikṣu had visited Buddha. This bhikṣu on meeting Buddha prostrated himself and prayed for rebirth as a universal sovereign; Buddha hereupon remarked with sorrow that as this man's merit was vast, and his faith firm, he would have attained Buddhahood if he had so desired. Now he would have to become a sovereign once for every atom of dust from the place of his prostration down to the 'gold wheel.' As he was given up to worldly joy the sacred fruit would be thus remote (that is, he would attain arhatship only after all these countless rebirths). To the south of this tope was a standing image of Kuan-tzū-tsai P'usa,²⁶ sometimes seen with a censer in the hand performing pradakṣiṇa to Buddha's temple. To the south of this was a tope which contained the shaven hairs and nail-clippings of the Buddha for three months; and devotees who performed pradakṣiṇa to this tope were often cured of their ailments. Near

25. ii p. 167.

26. Avalokiteśvara.

the tank outside the west wall was a tope where a Tīrthika holding a small bird in his hand²⁷ asked Buddha about life and death. South-east from this and above 50 paces within the wall was a remarkable bifurcated tree, according to the A and C texts 80 or 90 (but according to B and D eight or nine) feet high. This tree, the height of which never varied, had grown from a tooth-stick thrown on the ground by the Buddha.²⁸ To the east of the Tooth-stick tree was a large temple above 200 feet high where the Buddha had preached. To the north of this above 100 paces was a temple with an image of Kuan-tzū-tsai P'usa which believing worshippers saw in various forms and at different positions."²⁹

Later Additions

Of the temple of Bālāditya and later additions by Harṣa and his contemporaries we naturally get more specific details in Hiuen Tsang's account :

"To the north of this was a large temple above 300 feet high built by king Bālāditya. In its size and ornamentation and in its image of Buddha this temple resembled the one at the Bodhi Tree.

"To the north-east of Bālāditya's temple was a tope where Buddha had preached and to the north-west was a sitting place of the Four Past Buddhas; to the south was a bronze (t'u-shi) temple in course of construction by king Śilāditya. To the east of this above 200 paces and outside the wall of the establishment was king Pūrṇavarma's copper image of the Buddha more than 80 feet high in a six storeyed building. Two or three *li* north from this was a brick temple with a large image of Tārā P'usa, a popular object of worship. Within the south gate of the wall³⁰ was a large well which had been miraculously produced in the Buddha's lifetime."³¹

It will be noticed that Harṣa's bronze temple was not yet completed during Hiuen Tsang's stay in India. Pūrṇavarman is said elsewhere by the pilgrim to have been the last descendant of Aśoka and to have resuscitated the Bodhi tree after its destruction by the cruel and tyrannical Śaśāṅka of Gauḍa.³²

27. Also mentioned by I-tsing, p. 163 *post*.

28. Also mentioned by I-tsing, *Record* p. 35, *Rel. Em.* p. 95.

29. Watters ii, p. 170.

30. Of the Tārā temple, Spooner A.R.E.C., 1916-17, p. 45.

31. Watters: *Yuan Chwang*, ii, p. 171.

32. Watters ii, p. 115.

General Description : Hwui-Li

This account of the Master of the Law is brilliantly supplemented by the general description of the vihāra given by his pupil Hwui-Li in the biography of the Master :

“Moreover, the whole establishment is surrounded by a brick wall, which encloses the entire convent from without. One gate opens into the great college, from which are separated eight other halls, standing in the middle (of the Saṅghārāma). The richly adorned towers, and the fairy-like turrets, like pointed hill-tops, are congregated together. The observatories seem to be lost in the mists (*of the morning*), and the upper rooms tower above the clouds.³³

“From the windows one may see how the winds and the clouds produce new forms, and above the soaring eaves the conjunctions of the sun and moon may be observed.

“And then we may add how the deep, translucent ponds, bear on their surface the blue lotus, intermingled with the Kie-ni (*Kanaka*) flower, of deep red colour, and at intervals the Āmra groves spread over all, their shade.

“All the outside courts, in which are the priests’ chambers, are of four stages. The stages have dragon-projections and coloured eaves, the pearl-red pillars, carved and ornamented, the richly adorned balustrades, and the roofs covered with tiles that reflect the light in a thousand shades, these things add to the beauty of the scenes”.³⁴

I-tsing

I-tsing, who lived in Nālandā for a decade, gives a detailed account of the buildings of the monastery, their alignment and orientation, the technique of their construction and the size of the rooms occupied by the monks and the arrangements in them. He stresses the absence of privacy in these rooms, and the general impression produced by his vivid description tallies completely with that created by the earlier and more prosaic account of Hiuen Tsang, and the more lyrical descriptions of his biographer and of the composer of the Yaśovarman inscription to be cited presently :

“The configuration of this monastery is nearly that of a square, like the earth. On all the four sides, the straight and projecting

33. Cf. the description in Yaśovarman’s inscription, *infra*.

34. *Life*, pp. 111-2.

edge of the roof forms long covered galleries which go all round the edifice. All the buildings are in brick; they comprise three stories, each story being more than 10 feet high. The transverse beams are joined by plates and there are neither rafters nor tiles, but with bricks they have made an esplanade; all the temples³⁵ are perfectly aligned and we can go and come at our ease. The wall of the last edifice constitutes the outer wall. The tiers of bricks rise to a height of thirty or forty feet. At the top there are representations of human heads of natural size.

“As to the residences of the monks, there are nine of them on each front; each habitation has a surface of about twenty square feet. At the farther end they have opened a window which rises up to the edge of the roof. Though the doors are high, they have made them with a single leaf in a manner that all can be seen from a distance; it is not allowed to put in any blinds there. Casting a cursory glance from outside, one sees all the four sides at a time; a mutual surveillance is thus exercised; how would it be possible to do the least thing secretly? At the top of one of the angles, they have made a suspended way which allows of going and coming over the temple. At each of the four angles there is a hall constructed of bricks; learned and venerable monks live there.

“The gate of the temple is turned towards the west; its top floor soars into the sky and makes one giddy in the open. There are marvellous sculptured images the beauty of which touches the limit in the art of ornamentation. This gate is connected to the main building which has no distinct beginning; but two steps before it they have erected four columns. Though this gate is not of a great height, the wood work they have put in there is extremely strong.

“Every time the hour for a meal comes they raise the fastening bars at all the doors. It is in fact the aim of the holy religion to preclude hidden things.”

Flooring

“In the interior of the monastery, wide spaces of more than 30 paces are paved in brick. For the smaller spaces of five to ten feet, for all the spaces which cover the rooms, those which are on the roof, before the verandah or in the habitations, they have used fragments of big bricks of the size of peaches or jujubes; they

35. We shall see, a few lines later, that in the monastery of Nālandā there were no fewer than eight temples—Chavannes.

mix them together with a sticky paste and they strike on them with beaters so as to make them level. They enclose the circumference with lime. They make a mixture of the fibres of hemp to which they add oil with the remnants of hemp and the debris of old hides; they moisten it for many days after they spread this plaster on the floor filled with bricks; they cover it all with green herbs. After about three days they see if it has become dry. They rub the surface many times with polishing stones; they sprinkle it with a shower of red earth or a substance like cinnabār. Then, with a greasy plaster, they make it polished and clear like a mirror. All the halls and the steps of the staircases are finished in this manner. When these operations have come to an end, the passers-by can tread on this surface with their feet and traverse it for ten or twenty years without its ever deteriorating or cracking. This is not like lime which when it is moistened by water does not fail to scale off.

Plan of Temples

"There are no fewer than eight temples so constructed. Up above, all have a level terrace and we can walk there. Their dimensions are more or less similar. To the eastern side of each temple, they have chosen a building, sometimes simple, sometimes triple, for placing the holy images therein. Or else, at a variable distance to the front on the same side, they have erected an observatory in the form of a terrace which serves as the hall of Buddha.

"On the western side of the temple, outside the great enclosure, they have built here and there large stūpas³⁶ (tsoei-tou-po) and a large number of caityas (tche-ti). Their number is (about) a hundred. The sacred vestiges are close to one another and defy enumeration. Gold and precious stones form a brilliant ornamentation; in truth, there are few places so perfect."³⁷

Not satisfied with his verbal description, I-tsing prepared a plan of the monastery calculated to enable the reader to follow his account more easily. The plan is unfortunately lost, but here is his introduction to it where he explains its purpose, and his wistful longing for a similar institution in China:

36. According to this passage the difference between the stūpa and the caitya appears to be above all in the size of the two sorts of edifices, the first being more raised than the second. (See however *n.* 7, p. 39—"They call caitya the places consecrated by the great events of the life of Buddha. They count eight of them.")—Chavannes.

37. *Rel. Em.* pp. 85-7.

“Although I describe again the form of the temple I still fear that there is some confusion in the thing; I have therefore drawn up this design, which represents its plan, hoping thus that the eyes will catch it without difficulty. If we could propose to the Emperor the construction of a temple conforming to this model, the perfection of the Royal Residence (Kusāgārapura) and that of China would be alike.

“Sighing for this, I said: ‘a crowd of good works are as formerly harmoniously disposed; all the eminent men are already old for us; one sees thus that living persons are separated from the dead; how should the heart not be afflicted by this?’”³⁸

I-tsing’s observations which accompanied the missing plan are worth reproducing on account of the precise details they furnish regarding the relative position of the various buildings. A stūpa of Bālāditya is located, and more details of ornamentation and sculpture are furnished.

“When one has seen one of the temples, the seven others are identical. On the top they offer a level terrace on which people can walk.

“In examining the configuration of the monastery, it is necessary to look at it from the Western façade;³⁹ it is while going to the West, outside the entrance, that one well apprehends the true form of it.

“About twenty steps to the south of the door, on the edge of the road, there is a *tsoel-tou-po* (stūpa) more than a hundred feet high. It is there that formerly the Honoured of the World (loka-jyeṣṭha) passed in retreat the three months of summer.⁴⁰ The Sanskrit name of this edifice is *Mou-louo-kien-t’ouo-kiu-ti* (Mūla-gandha-koṭi), which signifies in Chinese: the hall perfumed by the first source.⁴¹

“More than fifty steps to the north of the door-way there is another great stūpa higher still than the first. It is the king *Yeou-je* (Bālāditya) who raised it. Both are alike built of bricks. The ornamentation with which they are covered is of remarkable delicateness; there are found beds of gold and floors of precious stones.

38. *Ib.* p. 93.

39. As corrected in the light of *Ki-ye* at BEFEO iv, p. 80.

40. The retreat of summer (*varṣa*) lasted in India from the middle of June up to the middle of October—Chavannes. *Varṣa*, however, is ‘rainy season.’

41. They called *Koṭi* or *Gandhakoṭi* all the places where the Buddha had stayed for a time.—Chavannes.

The offerings are of a rare beauty. At the centre there is an image of *Jou-lai* (Tathāgata) turning the wheel of the law. Further on, to the south-west, there is a small *tche-ti* (caitya) about ten feet high; it is there that a *P'ouo-louo-men* (Brahman) who held a small bird in his hand posed some questions;⁴² what they call in Chinese the pagoda of the oriole, is this same edifice.

“To the west of the ‘hall of the first origin’ (mūla-gandha-koṭi), there is a tree of the species that the *Fo* (Buddha) prescribed for the teeth.⁴³ It is not a willow.

“Still more to the west, on the edge of the road, is found an altar of Prohibitions.⁴⁴ It is more than ten feet, large measure, each side. It consists of a brick wall more than two feet high that they have raised on a plane area; in the interior of the enclosure is a raised seat, about five inches higher than the surrounding (area); at the centre is a small *tche-ti* (caitya). From the east of the altar to the angle of the hall, there is the emplacement of a covered walk of the Buddha; it is made of rows of bricks; it is about two cubits broad, about fourteen or fifteen long and more than two cubits high. On the promenade they have fashioned with lime which they have left white, representations of the lotus flower; they are about two cubits high and more than one foot broad; there are fourteen or fifteen of them; they mark the traces of the feet of Buddha.”⁴⁵

Evidence of Seals

The village of Bargaon and its monuments and mounds were first noticed in modern times by Buchanan-Hamilton who visited the place in the first quarter of the nineteenth century. Cunning-

42. Hiuen Tsang also speaks of the stūpa where a heretic with a sparrow in his hand questioned the Buddha on the subject of death and of life.—Chavannes. See p. 158 *ante*.

43. Cf. Hiuen Tsang, p. 158, *ante*.

44. It is there that the novitiates were admitted to receive ten prohibitions and entered the order definitely. Cf. Edkins: *Chinese Buddhism*, p. 35.—Chavannes.

45. *Rel. Em.* pp. 94-6. In the *Nan-hai*. I-tsing speaks of the walks of the Buddha. There were these walks in all places that the Faithful often visited, as at the base of the Gr̥dhrakūṭa and at the foot of the Bodhidruma, in the Mṛgadāva and in Rājagṛhapura. All these walks had the same dimensions. But, according to the text of the *Nan-hai*....., the flowers of lotus that mark the traces of the feet of the Buddha are only two inches and not more than two cubits high. There must therefore be a fault in one of the two texts. The reading ‘two inches’ seems to me preferable.—Chavannes.

ham was the first to identify these ruins with the ancient Nālandā, basing himself on the travel account of Hiuen Tsang, and the inscriptions on some of the images he collected there. His account of the site in his first report is still very instructive study. Some years later Broadley carried out some amateur diggings and published a monograph based on them in 1872, without earning the thanks of his successors in the field.

Excavations of a systematic nature carried on since 1915 have yielded, as noted already, a number of very interesting minor antiquities besides giving striking proof of the accuracy of the literary accounts of Nālandā which we get from the Chinese writers. The most interesting among these minor antiquities are the inscribed clay seals, one of the earliest among which has been noticed already. There are at least three seals of different dates, all belonging to the Maukharis of Kanauj; and other unpublished seals of the same line of kings are said to be preserved in the Nālandā Museum.⁴⁶ The three published seals belong to Hari-varman (475-500 A.D.), Īśānavarman (550-76) and Śarvavarman (576-79).⁴⁷ We may be fairly certain that the great University was in continuous receipt of Maukhari patronage, and one wonders if the king of Mid-India named by Hiuen Tsang after Vajra as the builder of one of the temples in Nālandā was after all a Maukhari. One other seal⁴⁸ proves the connection with Nālandā of the great Harṣavardhana whose patronage of Buddhism in general and of Nālandā in particular is amply attested in the pages of Hiuen Tsang; and yet another seal⁴⁹ shows that the contemporary and friend of Harṣa, Bhāskaravarman of Assam, was also among the patrons of the great vihāra.

Yaśovarman

We must also take note of the stone inscription of another Maukhari ruler Yaśovarmadeva (729-43 A.D.) who was known only by literary references till the discovery of this stone inscriptions.⁵⁰ The object of the inscription is to record the gifts to

46. Pires, *Maukharis*, p. 61 n. 2 and p. 92 n. 3.

47. Bhandarkar, *List* Nos. 2079-81.

48. *Ib.* No. 2086.

49. *Ib.* No. 1667.

50. Bhandarkar, *List* No. 1742 as also 2105 and *n.* Also Pires, *The Maukharis* pp. 144-5. I offer a fresh translation of the verses on Nālandā; Dr. Hirananda Sastri's translation is influenced by his untenable theories regarding Yaśovarman. The inscription, is definitely a record of Yaśovarman's time, and Bālāditya comes in most incidentally.

the vihāra from Mālāda, the son of a minister of Yaśovarman and guardian of his northern frontier; the gifts were made in part to the Buddha image in the temple of Bālāditya and in part to the monks of the Saṅgha. The general description of the vihāra of Nālandā, and the particular account of Bālāditya's temple contained in this inscription are worth citing here for comparison with the Chinese accounts reproduced above :

“Nālandā with her scholars famed for their learning in the sacred texts and the arts, and with the clusters of rays (issuing) from her caityas shining brightly like white clouds,—(Nālandā) seems to laugh at all the cities of monarchs, who had gained fame (wealth) by ripping the temples⁵¹ of (enemy) elephants on hotly contested battle fields (4). The row of her vihāras with the series of their finials touching the clouds appears like a pretty festoon made for the Earth by the Creator and shining in the aerial region; her palatial temples brilliant with the network of rays (issuing) from their numerous jewels bear the splendour of Sumeru—the pleasant abode of groups of good Vidyādhara (of the Saṅgha which upholds right learning)⁵² (5). Here was erected by the great king Bālāditya of irresistible valour, after he conquered all his enemies and brought the whole earth under his sway, a large and beautiful white temple (prāsāda) to Bhagavān Buddha, to indulge, I think, his desire to see the Kailāsa excelled (in splendour) (6). Moreover, spurning the lustre of the moon, surpassing the beauty of the rows of Himalayan peaks, casting into the shade the white Gaṅgā of the heavens, and silencing other disputing streams⁵³ (also streams of disputants), (this prāsādā), I believe, has discovered after wandering all over the earth that there are no more conquests to be made, and has come to think that any further wandering would be in vain, and then, come to stay here like a lofty column of great fame. (7)”

This *praśasti* was composed by two monks of Nālandā itself by command of the Saṅgha; the authors, Śīlacandra and Svāmidatta, were conscious of the inadequacy of their powers for the great task to which they had been called, and their touching apology, echoing Kālidāsa, reads :

‘Vāñchetāṃ kim na paṅgū śikhari-taruphalāvāptimuccaiḥ
kareṇa |

51. I have not translated a cumbrous attribute to the elephants' temples.

52. The pun on *Sadvidyādhara-saṅgha* is almost untranslatable.

53. There is a subtle and untranslatable play on the words *mūkayan vādi-sindhūn*, and *bhuvana iha vṛthā bhrāntirityākalayya*.

Pālas

From the middle of the eighth century almost to the day of its ruin and destruction by Muslim invaders, Nālandā enjoyed the sustained patronage of the mighty Pāla kings,⁵⁴ and excavation has brought to light much unmistakable evidence of this. An illegible copper-plate⁵⁵ which, judging from the seal soldered to its top and bearing the legend *Dharmapāladevaḥ* in one line below a dharma-cakra, must have contained a record of Dharmapāladeva, the second ruler of the Pāla dynasty, constitutes the earliest bit of evidence in this series. Of the reign of Devapāladeva in the ninth century, we have two records from Nālandā itself, besides the evidence of the Ghosrāwan inscription on the flourishing state of Buddhism at the time.⁵⁶

Abbot Vīradeva

The Ghosrāwā inscription is not dated; but mentions Devapāladeva as the patron of Vīradeva who was elected to the presidency of the vihāra of Nālandā to succeed Satyabodhi whose close friend and right hand man Vīradeva had been for some time before his election to the succession. The inscription reads:

Bhikṣor-ātmasamaḥ suhr̥d-bhuja iva
Śrī-Satyabodher-nijo |
Nālandā-paripālanāya niyataḥ
saṅghasthiter-yas-sthitaḥ ||

Vīradeva came from Nagarahāra in the Jelalabad valley and had studied scripture under Sarvajñaśānti of the Kaniṣka vihāra in Peshawar before he went to Bihār and gained the esteem of Devapāla and the monks of Nālandā.

One of the two Nālandā records of Devapāla's time is a short inscription in the pedestal of a metal image, the gift of the king.⁵⁷

54. The Gurjara-Pratihāras also patronised it if Page is right in ascribing some votive inscriptions of Nālandā to the time of Mahīpāla of Kanauj c. A.D. 850. 'The coins found at Nālandā include those of Kumāragupta I and Narasimhagupta of the Gupta lineage, Śaśānka of Bengal (c. 600-620), Ādivarāhe or Bhoja I of the Pratihāra dynasty (c. 835-85), and of Govindacandra of the Gāhadvāla dynasty (c. 1114-55). All of these are now deposited in the Indian Museum'—A. Ghosh, *op. cit.* p. 38.

55. ASI, 1924-5, p. 86. Bhandarkar, *List* No. 2082.

56. Kielhorn, *IA*, xvii, pp. 309-11.

57. Bhandarkar, *List*, 2083.

The other⁵⁸ is a celebrated document recorded on one of the largest copper plates known, if not the largest, measuring 2' x 2½' inscribed on both sides, the first bearing 42 lines and the other 24 lines in pre-Nāgari script and in the Sanskrit language; the formula of gift, lines 21-43, is in prose and the rest in verse. The seal soldered to the top of the plate bears the inscription: 'Śrī Devapāladevasya.' The record is dated in the thirty-ninth year of Devapāla, c. A.D. 860. That Devapāla was himself a Buddhist, not merely a patron of Buddhism, is clear from his being styled in this record and in the Monghyr plate of his thirty-third year as follows:

'Paramasaugataḥ Parameśvaraḥ Paramabhaṭṭārako Mahārājādhirājaḥ śrīmān Devapāladevaḥ.'

Bālaputra's vihāra

The chief interest of the Nālandā plate of Devapāla lies in the fact that it records the construction, at Nālandā, of a fresh *vihāra* by Bālaputra deva, the Śailendra ruler of Suvarṇadvīpa (Sumatra), and the gift, with Devapāla's permission, of five villages to this new *Vihāra* for the purposes detailed in the following terms :

"to serve as the source of income for the temple of the worshipful Lord Buddha and of the Initiates in the entire Dharma beginning with Prajñāpāramitā ; for the bali- and caru-offerings, the accommodation, clothing, alms, beds, seats, the needs of the sick like medicines, etc., of the Saṅgha of honourable monks of the four quarters, being a group of Tāntrika-Bodhisatvas in whom the eight Mahāpuruṣas are reincarnate; for the copying, etc., of the Dharma-ratna and for the repair of the building of the vihāra when it becomes dilapidated."⁵⁹

Organisation

The new monastery then is a self-contained unit, with its own arrangements for worship, study and good living, and with its own separate budget. It is possible that these features mark it off as a foreign monastery, maintained by a foreign power for the benefit of its own nationals who came to study in Nālandā. It was, so to say, the 'Suvarṇadvīpa Hall' of the University. But there is nothing to preclude the supposition that the whole place was organised from the beginning in such distinct units, each with its own distinct features; in fact some support may be found for this idea,

58. *Ib.*, 1613.

59. I have followed Bosch's interpretation of these rather involved phrases.

in the progressive increase in the number of 'temples' that we are able to trace, though not in all its stages, in the course of generations. And Bālaputra might only have followed a procedure for which there were several precedents when he made the arrangements actually detailed in the charter of his vihāra. The constitution of Nālandā then seems to have been very like that of a large modern university organised in residential colleges clustering together within a small area and maintaining constant touch with one another.

National vihāras

In establishing on a permanent footing a *vihāra* at Nālandā for the convenience of his subjects visiting that great centre of learning and religion in a distant land, Bālaputra might have been influenced by what he heard of similar institutions maintained by others elsewhere in India, and he was also setting a precedent to be followed by one of his successors more than a century later in South India. There was in existence at Nāgārjunikoṇḍa in the very early centuries of the Christian era a *sīhala-vihāra*, a monastery for Ceylonese monks who were actively engaged in spreading the light of true knowledge all over India; but this vihāra was an endowment of the members of the Ikṣvāku family ruling in the locality, and not a creation of the Kings of Ceylon for the benefit of their countrymen visiting Nāgārjunikoṇḍa. A closer analogy is furnished by Meghavarna's vihāra in Buddha Gayā which was erected by the Ceylonese king with the permission of Samudragupta to meet the felt needs of visitors from Ceylon to the holy land, and was still flourishing as a magnificent establishment when Hiuen Tsang visited it in the seventh century.⁶⁰ I-tsing mentions several other examples. He records that a king of the South Indian kingdom of Kuluka, possibly Kolkai, i.e., Pāṇḍyan kingdom according to Chavannes, had built a vihāra for the use of his subjects at a distance of two yojanas to the north-east of the Mahābodhi temple at Bodh Gayā. There were separate monasteries also for the people of Tukhāra and Kāpiśa from the North. There was again a Chinese cloister at Mṛgaśikhāvana at a distance of forty yojanas to the east of Nālandā; this establishment had been founded by Śrī Gupta and granted twenty-four villages for its maintenance; but when I-tsing came to India it had fallen into decay, so that he complained that while all other nations had facilities for their sojourn in the holy land, the Chinese alone lacked it in his

60. Smith, EHI⁴, pp. 303-4.

time. It has been suggested with great plausibility (by Bosch) that these foundations maintained by different kingdoms at a considerable expense had other purposes to serve besides serving the religious interests of pilgrims; merchants and ambassadors might have found good use for them also and they might have had a share in furthering profitable trade relations and friendly, political and secular intercourse among the different countries involved.⁶¹

Bālaputra's example in turn, was followed in the eleventh century by Cūḍāmaṇi Varman and his son Māravijayottuṅgavarman who built and endowed a splendid vihāra for the monks of the Śailendra kingdom at Negapatam, then the first port of call for all pilgrims to South India by the sea-route from China and Śrī Vijaya; and we hear again of this famous establishment at the close of the century in the inscriptions of the reign of Kulottuṅga I. Like the Bālaputra vihāra at Nālandā, it may be noted in passing, the site of the Cūḍāmaṇi-vihāra at Negapatam has yielded a sumptuous collection of Buddhist bronzes of varying sizes which are still awaiting publication.

Nālandā Art

The Bālaputra monastery and its bronzes raise the question of the relation of Nālandā art to Hindu-Javanese art. Writing in 1925, and struck by the remarkable likeness to Javanese technique exhibited by some of the Nālandā finds, particularly a bronze Akṣobhya (ASI, 1917-18, Pl. XIVa) from the Bālaputra vihāra as it turned out after the discovery of the Devapāla plate in 1921, Bosch⁶² formulated one of two possibilities for accounting for the resemblances noticed. Either Nālandā art and Hindu-Javanese art were branches of an originally common Buddhist art that flourished long before Java or Śrī Vijaya entered history, or the Nālandā bronzes were the direct productions of Javanese artists made by some of them settled in Nālandā or imported from Java in a finished form. He also pointed out that an image of a six-armed Yamāntaka from another monastery may well be considered the true prototype of the later Krodha forms so well known in Tibetan Buddhist art.⁶³

61. *Rel. Em.* pp. 80-4; Bosch, *op. cit.*, pp. 560-2.

62. *Op. cit.*, pp. 585-8.

63. *Ib.*, p. 581.

The Nālandā bronzes have been studied in some greater detail more recently in a monograph by Bernet-Kempers. The long and continuous intercourse between the region of Nālandā and the archipelago is attested by the appearance in Sumatra in the late seventh century of the Vajrayāna type of Buddhism of the Yogācāra school of Nālandā, and of pre-Nāgari script a little later in Java, the evolution of the script being quite up-to-date as compared with its development in India. A verse from the *Veṇīsamhāra* of Bhaṭṭa-Nārāyaṇa, a Bengali writer of the eighth century, reappears in the old Javanese Ādiparva. And we have in Kumāraghoṣa of the Kelurak inscription an instance of a Buddhist priest from Gauḍa who went and settled in Java. But apparently more people came to India from Sumatra and Java as the rise of the Bālaputra vihāra shows. This vihāra was exposed early in the excavations, in 1915, and over two hundred metal objects including many fine statues and statuettes were recovered from it. Bronze finds, on the other hand, are rare in the other monasteries of Nālandā. It is believed that this large find is the result of an accident in which the monastery perished by fire and its inmates had no time to remove the bronzes. However this may be, the fact of a part of Nālandā having perished by fire early in the eleventh century, and of having been renovated thereafter is recorded in an inscription of the eleventh year of Mahipāla I⁶⁴ attesting the gift of a door-joint by a certain Bālāditya of Kosāmbi during the *agni-dagdhoddhāra*. Some of these bronzes are inscribed in Devapāla's reign and are thus definitely products of Pāla art. They are all of the same school and must be taken to represent the gradual assemblage of pious gifts extending over some time, but not long. They resemble Javanese bronzes of the period rather closely, and the question of Javanese influence on them has been much discussed; but so high an authority as Krom has declared that he would have selected only a minority of them as products of Hindu-Javanese art if their find spot had been kept away from him.

The conclusion of Bernet-Kempers on this question seems to be just: 'The art of Nālandā, developed under the influence of Java, also produced deities which were unknown or not popular in Java. From Nālandā these and similar images were brought over to Burma, Nepal, Ceylon, etc., and also to Java, as is apparent from the bronzes from that country which show Pāla features.'⁶⁵ He also suggests that the Jambhala figure and a type of

64. Bhandarkar, *List*, No. 1626.

65. p. 71.

Buddha in Vajrāsana might have been taken over by Java from Nālandā art. But Javanese bronze-casting reached its high-water mark before the end of the eighth century, while the Nālandā group falls mostly in the ninth century. Let us remember also that these are not the earliest bronzes in India of their type, and that Pāla art, again, was not the only source of Indian influences playing on Javanese culture.

Another phase of Nālandā art which has not yet been studied in detail is illustrated by numerous stucco figures discovered in 1925-26 and doubtless forming part of a relatively early period in the life of the monastery. These form part of an original corner tower that was found to be completely encased in the solid brick work of a later structure. The stucco figures modelled on a foundation of clay are set in rows of separate niches in several tiers; they mostly represent the Buddha in different conventional attitudes, and their simple and effective style suggests a really early date for them. Mr. Page who brought them to light puts them in the 7th or 8th century; they may well be earlier.⁶⁶ In the year 1933-34 was recovered a magnificent image of the Bodhisattva Avalokiteśvara in a perfect state of preservation from a small chamber on the side of a caitya (No. 12), and this figure has been hailed 'as one of the finest sculptures left to us as a precious heirloom by the master sculptors of the Gupta period.'⁶⁷ It may be noted also in passing that several monasteries with monks' cells intact have been exposed by the excavations carried out over a number of years; these confirm very closely the accuracy of I-tsing's description of the vihāra, and 'some of the cells show clearly the shape of well-built true arches; the existence of these in Bihar about the middle of the ninth century is of great interest for the history of Indian architecture.'⁶⁸

Later History

We lack the means of tracing the fortunes of Nālandā in any detail during the eleventh and twelfth centuries. A Nāgari stone inscription discovered in two fragments in 1928-30 from the latest stratum of a Monastery numbered VII in the Archaeological reports is of some interest in this connection. It is not dated, but

66. ABIA, 1928, pp. 19-20. See p. 150 *ante*.

67. ABIA, 1934, p. 5.

68. *Ib.* p. 4.

doubtless belongs to the first half of the twelfth century A.D. as stated by N. G. Majumdar.⁶⁹

Vipulaśrī's Mitra Vihāra

The inscription details the Vidyāvamśa of a certain ascetic Vipulaśrīmitra and gives an account of his sacred foundations. It does not mention Nālandā by name, but seems to record the erection of a new monastery there by him, for the benefit of the Mitras, the line of ascetics to which he himself belonged. The provenance of the inscription together with the definite statement 'this vihāra made by him and given to the Mitras shines here as an ornament of the world excelling Indra's palace in beauty' must be accepted as sufficiently satisfactory evidence of what happened.

Library

The following passage from Satischandra Vidyabhushan on the University and Library of Nālandā will doubtless be read with great interest:⁷⁰ "According to Tibetan accounts the quarter in which the Nālandā University, with its grand library, was located, was called Dharmagañja (Piety Mart). It consisted of three grand buildings called Ratnasāgara, Ratnodadhi, and Ratnarañjaka, respectively. In Ratnodadhi, which was nine-storeyed, there were the sacred scripts called Prajñāpāramitā-sūtra, and Tāntrik works such as Samājaguhya, etc."

Destruction

When the wave of Muslim inroads swept over Bihār at the end of the twelfth century, Nālandā suffered a cruel destruction like much else; Islam, as a historic force, has been the most uncompromising enemy of Buddhism and Buddhist institutions from the heart of Central Asia to the Islands of the Southern Sea. The occurrences in Bihār are best described in the words of the leading Muslim historian of the times:⁷¹

"Muḥammad-i-Bakht-yār used to carry his depredations into those parts and that country until he organized an attack upon the fortified city of Bihār. Trustworthy persons have related on this wise, that he advanced to the gateway of the fortress of Bihār with two hundred horsemen in defensive armour, and suddenly at-

69. EI., xxi, p. 97.

70. *Indian Logic*, p. 516.

71. *Tabakat-i-Nasiri*, I, pp. 551-2.

tacked the place. There were two brothers of Farghānah, men of learning, one Nizām-ud-Din, the other Ṣamsām-ud-Dīn (by name) in the service of Muḥammad-i-Bakht-yār; and the author of this book met with Ṣamsām-ud-Dīn at Lakhaṇāwaṭī in the year 641 H., and this account is from him. These two wise brothers were soldiers among that band of holy warriors when they reached the gateway of the fortress and began the attack, at which time Muḥammad-i-Bakht-yār, by the force of his intrepidity, threw himself into the postern of the gateway of the place, and they captured the fortress, and acquired great booty. The greater number of the inhabitants of that place were Brahmans, and the whole of those Brahmans had their heads shaven; and they were all slain. There were a great number of books there; and, when all these books came under the observation of the Musalmāns, they summoned a number of Hindūs that they might give them information respecting the import of those books; but the whole of the Hindūs had been killed. On becoming acquainted [with the contents of those books], it was found that the whole of that fortress and city was a college, and in the Hindūi tongue, they call a college [*madrasa*] Bihār."

A Tibetan Tradition

But this apparently was not quite the end, for the Tibetan authorities have a tradition of their own which Vidyābhūshan recounts as follows:⁷² "After the Turuṣka raiders had made incursions in Nālandā, the temples and caityas there were repaired by a sage named Mudita Bhadra. Soon after this, Kukuṭasiddha, minister of the king of Magadha, created a temple at Nālandā, and, while a religious sermon was being delivered there, two very indigent Tīrthika mendicants appeared. Some naughty young novice-monks in disdain threw washing water on them. This made them very angry. After propitiating the sun for twelve years, they performed a *yajña*, fire-sacrifice, and threw living embers and ashes from the sacrificial pit into the Buddhist temples, etc. This produced a great conflagration which consumed Ratnodadhi. It is, however, said that many of the Buddhist scriptures were saved by water which leaked through the sacred volumes of Prajñā-pāramitā-sūtra and Tantra."

How Nālandā Rose

Such then was Nālandā for over a thousand years of its splendid history. Before proceeding to a study of the details of its organi-

72. *Indian Logic*, p. 516.

sation and institutions, of the names and fame of its teachers and the number and eminence of the visitors who came to it, we may well ask ourselves: what were the causes of the great popularity and eminence of Nālandā?⁷³ True the patronage of monarchs, the grant of protection, lands, immunities and what not by them to organised societies of monks, alone enabled them to fulfil the high calling to which they had dedicated themselves, and to kindle the light of the true knowledge of Dharma and spread it all over the world and thereby dispel the darkness of false knowledge and ignorance and even avert sickness, drought, war and other adversities. Nevertheless the question arises why Nālandā in particular, which had no great advantage by way of sacred associations with any striking incident in the life of the Buddha, and in this respect could hardly compete with Bodh Gayā, Sārnāth or Śrāvastī for instance attained a fame which cast all the other Saṅghārāmas of India into the shade. To such a question we are perhaps not in a position to furnish a completely satisfactory answer. But surely the happy geographical situation of Nālandā had something to do with it, and I-tsing is at some pains to bring home to his readers the great advantages of this situation. He writes:

“This temple faces in the south the royal town (Kuśāgārapura) from which it is only 30 *li* distant; ‘the peak of the vulture’ (Gr̥dhrakūṭa) and the ‘garden of bambus’ (Vēṇuvana) are both by the side of the town. To the south-west, we go to the ‘temple of the Great Intelligence’ (Mahābodhi), to the due south towards the mountain of the Foot of the Venerable (Gurupāda), these two spots being both about seven relays (yojanas). To the north, we go towards Vaiśālī which is at a distance of about twenty-five relays (yojanas). To the west, we look towards the Mṛgadāva which is more than twenty relays (yojanas); to the east, for going to the state of *Tan-mouo-li-ti* (Tāmralipti), there are sixty to seventy relays (yojanas). That is the sea-port whence we embark for returning to China.”^{73a}

These observations show that pilgrims taking the sea-route from China and Malayasia found it convenient to go to Nālandā from Tāmralipti, and plan the rest of their tour from there, a course which I-tsing himself adopted. And if they came by land, after all the perils and anxieties of their hard journey, the atmosphere

73. Cf. Bosch: *Een Ooorkonde*, TBG, lxx, pp. 530-2.

73a. *Rel. Em.* p. 97.

of quiet and study that prevailed in Nālandā invited them to stay there as long as they could before starting on the return journey. At Nālandā many pilgrims met, and it is no wonder that there grew up a lively trade in the two classes of goods, relics and manuscripts,⁷⁴ the acquisition of which was the chief inducement to the pilgrims to face the trouble and toil of their long journeys to the holy land and back. I-tsing alone carried away at the end of his ten years' stay in Nālandā about four hundred texts, sūtras, treatises on Vinaya, and śāstras, in Sanskrit, comprising together 500,000 ślokas, besides a faithful copy of the image at the Bodhimaṇḍa and three hundred relics.⁷⁵ Nālandā again had become from of old a centre of all types of higher study, not merely of Buddhism. In the old days Takṣaśilā had been the most celebrated of such centres as we can judge from the repeated references to it in the Jātaka stories and in early Sanskrit literature. But the frontier was exposed to many inroads by foreigners, and in the general disturbance of the period between the fall of the Mauryan empire and the establishment of Kuṣān power, Takṣaśilā might have been subjected to all the vicissitudes to which many other Saṅghārāmas in that quarter had to submit. It was seldom that these disturbances reached as far as Magadha, and the distance from the disturbed frontier which gave a relative immunity from trouble to Nālandā must have favoured it quite as much as its proximity to Tāmralipti, the port of landing for the pilgrims who came by sea from the East. Nālandā was a centre not only of Buddhism in its different aspects and of Buddhist studies, but of Brahmanical practices and scholasticism as well. The mention of *bali* and *caru*, quite Vedic names for offerings,⁷⁶ among the purposes for which the Bālaputra vihāra was endowed deserves to be noticed particularly in this connection, and we shall see that Hiuen Tsang himself studied Brahmanical scripture at Nālandā.

Studies of Hiuen Tsang at Nālandā

The following account of Hwui Li of the course of studies pursued by Hiuen Tsang during the fifteen months of his stay at Nālandā amply proves the wide scope and universal character of the educational courses pursued at that great centre:⁷⁷

74. Mss. known to have been copied in Nālandā are still found in all the more important collections of Mss. in all countries.

75. *Rel. Em.*, p. 193.

76. Cf. Bosch, p. 543 n 52a.

77. *Life*, p. 121.

“The Master of the Law whilst he stopped in the convent, heard the explanation of the Yoga-Śāstra, three times; the Nyāya-Anusāra-śāstra, once; the *Hin-hiang-tui fa-ming*, once; the Hetuvidyā-śāstra and the Śabdavidyā and the *tsah liang* śāstras, twice; the Prāṇyamūla śāstra-ṭikā, and the Śata-śāstra, thrice. The Kośa, Vibhāṣa, and the Śaṭpadābhidharma śāstras, he had already heard explained in the different parts of Kaśmir; but when he came to this convent he wished to study them again to satisfy some doubts he had: this done, he also devoted himself to the study of the Brāhmaṇ books and the work called Vyākaraṇa on Indian letters, whose origin is from the most remote date, and whose author is unknown.”

It should perhaps be stated that the Nyāya-Anusāra-śāstra was a Hinayānist work of the Sarvāstivādins,⁷⁸ and the Prāṇyamūla śāstra-ṭikā, one of the leading works of the Mādhyamika school of Mahāyāna. The Śatasūtra (Śāstra) was a work of Āryadeva, translated by Hiuen Tsang later.

General

In another context the biographer of Hiuen Tsang gives a glowing account of the greatness of Nālandā as a centre of higher study, the comprehensive range of its intellectual pursuits, and the varied attainments of its teachers :

“The Saṅghārāmas of India are counted by myriads, but this is the most remarkable for grandeur and height. The priests, belonging to the convent, or strangers (*residing therein*) always reach to the number of 10,000, who all study the Great Vehicle, and also (*the works belonging to*) the eighteen sects,⁷⁹ and not only so, but even ordinary works, such as the Vedas and other books, the Hetuvidyā, Śabdavidyā, the Cikitsāvidyā, the works on Magic (Atharvaveda), the Sāṅkhya; besides these they thoroughly investigate the ‘*miscellaneous*’ works.

Teachers

“There are 1000 men who can explain twenty collections of Sūtras and Śāstras; 500 who can explain thirty collections, and perhaps ten men, including the Master of the Law, who can explain fifty collections. Śilabhadra alone has studied and understood

78. Nanjio, No. 1265.

79. i.e. of the Hinayāna.

the whole number. His eminent virtue and advanced age have caused him to be regarded as the chief member of the community. Within the Temple they arrange every day about 100 pulpits for preaching, and the students attend these discourses without any fail, even for a minute (*an inch shadow on the dial*).⁸⁰

Hiuen Tsang himself has recorded what he saw of the academic life of the place together with the names of its prominent teachers and the causes of their celebrity in the following terms:

“In the establishment were some thousands of Brethren, all men of great ability and learning, several hundreds being highly esteemed and famous; the Brethren were very strict in observing the precepts and regulations of their order; they were looked up to as models by all India; learning and discussing they found the day too short; day and night they admonished each other, juniors and seniors mutually helping to perfection. If among them were any who did not talk of the mysteries of the Tripiṭaka such persons, being ashamed, lived aloof. Hence foreign students came to the establishment to put an end to their doubts and then became celebrated, and those who stole the name (of Nālandā Brother)⁸¹ were all treated with respect wherever they went. Of those from abroad, who wished to enter the schools of discussion the majority, beaten by the difficulties of the problems, withdrew;⁸² and those who were deeply versed in old and modern learning were admitted, only two or three out of ten succeeding.

“Among the celebrated men of Nālandā who had kept up the lustre of the establishment and continued its guiding work, there were Dharmapāla⁸³ and Candrapāla who gave a fragrance to Buddha’s teachings, Guṇamati and Sthiramati⁸⁴ of excellent reputation among contemporaries, Prabhāmitra of clear argument, and Jinamitra of elevated conversation, Jñānacandra of model character and perspicacious intellect, and Śīlabhadra⁸⁵ whose perfect excel-

80. *Life*, p. 112.

81. Bogus degrees then were not unknown even in those remote times!

82. Watters doubts the ‘gate-keeper’s part’ in this; he thinks it was only a process of ‘obtaining entrance’ or ‘admission to the schools of debate.’ (168). But at Vikramaśilā, the gate-keepers’ places were held by distinguished pandits. *Vidyābhūṣan, Ind. Logic*, p. 520.

83. d. c. A.D. 600. A native of Kāñcī, he taught at Nālandā for thirty years and went to Suvarṇadvīpa towards the end of his life—BEFEO xxx, p. 56 n. 3.

84. Both earlier than Dharmapāla.

85. Abbot of the monastery during H. T.’s visit.

lence was buried in obscurity. All these were men of merit and learning, and authors of several treatises widely known and highly valued by contemporaries.”⁸⁶

Studies described by I-tsing

I-tsing states that the number of fully ordained monks in his day was 3500 ; together with the novitiates, the number exceeded 5000.⁸⁷ His account of the course of education is of more general interest, but was also meant to describe what prevailed in Nālandā. It will be seen that it conforms very closely to the indications furnished in the less systematic account of Hiuen Tsang. After sketching the elementary study of the Siddham in the beginning, followed by Sūtra, Dhātu and Khila, all relating to grammar, I-tsing's account proceeds to describe the study of the *Kāśikā-vṛtti* and what followed:

“This Vṛtti-sūtra⁸⁸ is a work of the learned Jayāditya. He was a man of great ability; his literary power was very striking. He understood things which he had heard once, not requiring to be taught twice. He revered the Three Honourable Ones (*i.e.*, Triratna), and constantly performed the meritorious actions. It is now nearly thirty years since his death (A.D. 661-662). After having studied this commentary, students begin to learn composition in prose and verse, and devote themselves to logic (Hetuvidyā) and metaphysic (Abhidharmakośa). In learning the Nyāyadvāratāraka-śāstra, they rightly draw inferences (Anumāna); and by studying the Jātakamālā their powers of comprehension increase. Thus instructed by their teachers and instructing others they pass two or three years, generally in the Nālandā monastery in Central India, or in the country of Vālabhi (Wala) in Western India. These two places are like Chin-ma, Shih-ch'u, Lungmen, and Ch'ue-li⁸⁹ in China, and there eminent and accomplished men assemble in crowds, discuss possible and impossible doctrines, and after having been assured of the excellence of their opinions by wise men, become far-famed for their wisdom. To try the sharpness of their wit (*lit.* 'sharp point of the sword'), they proceed to the king's court to lay down before it the sharp weapon (of their abilities); there they present their schemes and show their (*political*) talent, seeking to be appointed in the practical government.

86. Watters: *Yüan Chwang*, Vol. II, pp. 164-5.

87. *Rel. Em.*, p. 97 and n. 1.

88. *Kāśikā-vṛtti*.

89. Seats of learning in China.

When they are present in the House of Debate, they *in a grave demeanour, sit in the āsanās*⁹⁰ and seek to prove their wonderful cleverness.

“When they are refuting heretic doctrines all their opponents become tongue-tied and acknowledge themselves undone. Then the sound of their fame makes the five mountains (of India) vibrate, and their renown flows, as it were, over the four borders. They receive grants of land, and are advanced to high rank. They give dissertations upon the great system.⁹¹ After this they can follow whatever occupation they like”.⁹²

Disputation

It will not escape the attention of the reader what a large part oral disputation played in the educational programme of those days. Scholars of established reputation all the world over, and young aspirants to academic knowledge and fame flocked to Nālandā to take part in, or at least be witnesses to, the open disputations in which theses on points of controversy were stated, defended and attacked, reputations made or lost. It was indeed a proud day in a scholar's life when he won his spurs in controversy, together with a title and other insignia of academic distinction, which gained him a sure place in public esteem as I-tsing states, and as we may surmise, opened out to the lay pupils the road to material prosperity in some secular office in the service of the State.

Endowments

The economic basis of this good life of the spirit was well secured by the pious devotion of the rulers of the land. The endowments recorded in the stone inscriptions of Yaśovarman and the copperplate of Devapāla's reign are only typical of a large class of benefactions, the cumulative result of which is very clearly indicated to us by the invaluable accounts of the Chinese pilgrims. And the inmates of these richly endowed institutions merited the support they got not only by their scholarship, but by the modesty and

90. The italicised translation is that of Jayaswal, JASB vii (1911) p. 312 for ‘*raise their seat*’ of Takakusu.

91. Jayaswal, JASB vii (1911) p. 312, referring also to digvijaya of Paṇḍitas. Takakusu has here: *their famous names are, as a reward, written in white on their lofty gates.*

92. *Record*, pp. 176-178.

well-regulated discipline of their personal conduct. Thus says Hwui Li :⁹³

“The priests dwelling here, are, as a body, naturally (or *spontaneously*) dignified and grave, so that during the 700 years since the foundation of the establishment, there has been no single case of guilty rebellion against the rules.

“The king of the country respects and honours the priests, and has remitted the revenues of about 100 villages for the endowment of the convent. Two hundred householders in these villages, day by day, contribute several hundred piculs of ordinary rice, and several hundred catties in weight of butter and milk.^{93a} Hence the students here, being so abundantly supplied, do not require to ask for the four requisities. This is the source of the perfection of their studies, to which they have arrived.”

I-tsing puts the number of villages set apart for the support of the monastery as 200 in one place and 201 in another. In the *Record* he says :

“The rites of the monastery of Nālandā are still more strict. Consequently the number of the residents is great and exceeds 3,000. The lands in its possession contain more than 200 villages. They have been bestowed (upon the monastery) by kings of many generations. Thus the prosperity of the religion continues ever, owing to nothing but (the fact that) the Vinaya (is being strictly carried out).”⁹⁴

And elsewhere:⁹⁵ “There are 201 villages which are under them; the sovereigns have, from generation to generation, given them these men and these lands for their perpetual upkeep’.

Financial Administration

Some account is given by I-tsing of the economic administration of the vihāra and its properties ; we do not get much on the income side with which the monk perhaps did not concern himself; but on the method of regulating expenditure, and the sanctions behind it we get something of importance and interest:

“Those who have charge of guarding the granaries and supervision of the lands, though they be two or three, must also send a servant for the administration of the granaries. This (servant)

93. *Life*, pp. 112-3.

93a. 1 picul=133½ lbs. 1 catty=160 lbs.—Beal.

94. *Record* p. 65.

95. *Rel. Em.* p. 97.

joins hands and makes his declaration; if every body is agreed, then it may be done. For the expenses, in truth the defect that some one may arbitrarily dispose of it does not exist. If any one does not make public declaration and employs something arbitrarily, *be it only* a twentieth of a bushel of grain, he is forthwith expelled by his colleagues. If a person considers himself so powerful, that he uses as he pleases the goods of the community, that he decides important affairs on his own private authority and without *declaring* to the assembly, they call him *Kiu-louo-po-ti* (*Kulapati*),⁹⁶ which signifies 'chief of the family'; that is a grave defect in the eyes of the Law of Buddha; that is what men and gods hate altogether; however useful to the monastery this same person might be later on, a very great fault has been definitely committed by him. Those who are wise certainly do not act thus."⁹⁷

Hospitality

The material life of the monastery stood at a fairly high level of comfort, and may be said to compare by no means unfavourably with similar institutions maintained in our own day by the Jesuits all the world over. The biographer of Hiuen Tsang gives a magnificent account of the reception accorded to the Master of the Law, and the supplies that were granted to him during the period of his stay in the *vihāra*. This account is interspersed with the story of Hiuen Tsang's meeting with Śīlabhadra, of a former dream of Śīlabhadra that had prepared him well in advance for the arrival of the Chinese monk, and of his acceptance of the foreigner as his disciple. I reproduce Hwui Li's account of all this without any change in his sequence:

Reception to Hiuen Tsang

"On the tenth day he went to the Nālandā temple; the congregation there had selected four of their number, of distinguished position, to go and meet him; journeying in their company about seven yojanas he reached the farm-house belonging to the temple. It was in (*the village, where*) this house (*stands*), that the honourable Maudgalyāyana was born. Halting here for short refreshment, then, with two hundred priests and some thousand lay patrons, who

96. We see that the term *Kulapati* when it is applied to a monk is far from being an honorific as was thought at one time (Burnouf—*Introd. à l'hist. du Bouddhisme Indien*, p. 216, n. 2).—Chavannes.

97. *Rel. Em.* p. 90.

surrounded him as he went, recounting his praises, and carrying standards, umbrellas, flowers and perfumes, he entered Nālandā.

“Having arrived there he was joined by the whole body of the community, who exchanged friendly greetings with the Master, and then placing a special seat by the side of the Sthavira (*presiding priest*), they requested the Master to be seated. The others then also sat down.

Supplies ordered

“After this the Karmadāna was directed to sound the Ghaṇṭā and proclaim: ‘Whilst the Master of the Law dwells in the convent, all the commodities used by the priests and all the appliances of religion are for his convenience, in common with the rest.’

Escorted to Śīlabhadra

“Then selecting twenty men of middle age, skilful in explaining the religious books and of dignified carriage, they deputed them to conduct the Master to the presence of *Ching-fa-tsong* (treasure of the good law). This is the same as Śīlabhadra.

“The congregation, from the excessive respect they have to him, do not venture to call him by his name, but give him the appellation of *Ching-fa-tsong*.

Hiuen Tsang meets Śīlabhadra

“Whereupon, following the rest, he entered to salute this eminent person. Having seen him, then the chief almoner presented him (i.e. Śīlabhadra) with all things necessary without stint, paying his respects according to the proper ceremonial, approaching him on his knees and kissing his foot, and bowing his head to the ground. The usual greetings and compliments being finished *Fa-tsong* ordered seats to be brought and spread out, and desired the Master of the Law and the rest to be seated. When seated he asked the Master of the Law from what part he came; in reply he said: ‘I am come from the country of China, desiring to learn from your instruction the principles of the Yoga-Śāstra.’

Story of the dream

“Hearing this, he called for his disciple Buddhabhadra, whilst tears filled his eyes; now Buddhabhadra was the nephew of *Fa-tsong*, and upwards of seventy years of age, thoroughly versed in the Sūtras and Śāstras, and excellent in discourse. *Fa-tsong*

addressing him said : ' You may recount for the sake of the company present, the history of my sickness and sufferings three years ago.'

"Buddhabhadra having heard the request sobbed aloud and wept—but then restraining his tears he declared the past history and said : ' My Master (Upādhyāya) some time ago was painfully afflicted with colic. On each occasion when the attack came on, his hands and feet were cramped with pain, and he would suddenly cry out with agony as if he had been burned with fire, or pierced with a knife; the attack would subside as suddenly as it came on; and this went on for twenty years and more. But three years ago the severity of his suffering was so hard to bear, that he loathed his very life and desired to starve himself to death. In the middle of the night he had a dream in which he saw three Devas (*heavenly men*), one of the colour of gold, another of the colour of bright crystal, another as white as silver, their appearance and form commanding, of dignified presence, and clad in light shining garments; approaching the Master they asked him, saying; 'Are you anxious to get free from this body of yours? The Scriptures speak, saying, the body is born to suffering; they do not say we should hate and cast away the body. You in one of your past births were the king of a certain country, and you caused much suffering among living creatures, and now you have this suffering as your recompense. Search out therefore and examine your past faults, and repent of them sincerely; take your affliction quietly and patiently; labour diligently in explaining the Sūtras and Śāstras; you will thus get rid of your pain yourself; but if you loathe your body, there will be no cessation to your sufferings'.

"The Master having heard these words, paid his adorations with the utmost sincerity.

"Then the golden-coloured one, pointing to the one that shone like crystal, said to the Master: 'Dost thou know or not that this one is Avalokiteśvara Bodhisattva?' and then pointing to the silver-coloured one he added: 'and this is Maitreya Bodhisattva'.

"The Master immediately paid worship to Maitreya and asked him, saying: 'Your servant Śīlabhadra has ever prayed that he may be born in your exalted palace courts, but he knows not whether he will gain his wish or not.' In reply, he said, 'You must widely disseminate the true law, and then you shall be born there.'

"The golden-coloured one said: 'And I am Mañjuśrī Bôdhisattva. Seeing that you desired to get rid of your life, contrary to

your true interest, we are come to exhort you to the contrary; you should rely on our words, and exhibit abroad the true law, the *Yoga śāstra* and the rest, for the benefit of those who have not yet heard it. Your body will thus by degrees become easy and you will suffer no further pain. Do not overlook that there is a priest of the country of China who delights in examining the great Law and is desirous to study with you: you ought to instruct him carefully.'

"*Fa-tsong* having heard these words worshipped and answered: 'I shall obey, according to your honourable instructions.' Having said this, they disappeared.

"From that time the sufferings of the Master from his disease came to an end.

"The company present hearing this history were all filled with wonder at the miraculous event.

Its Effect on Hiuen Tsang

"The Master of the Law having heard for himself this narrative was unable to control his feelings of sympathy and joy. He again paid his respects and said: 'If it be so, as you say, then Hiuen Tsang ought with his utmost strength to listen to and practise (*your religious advice*). Would that your reverence, of his great compassion, would receive me for the purpose of instruction.'

Accepted as disciple

"Then *Fa-tsong* asked him further, 'For how many years have you been on your journey?' He answered, 'During three years;' and so, as the particulars of his directions, received in his dream, were completely fulfilled, he caused the Master of the Law to rejoice in their relationship as Master and disciple.

His Residence

"After these words he retired and went to the college of Bālāditya-rāja and took up his residence in the dwelling of Buddhābhadrā, having four storeys (or, *the fourth storey*), who entertained for seven days. After this he went to reside in a dwelling to the north of the abode of Dharmapāla Bodhisattva, where he was provided with every sort of charitable offering. Each day he received 120 Jambiras, 20 *Pin-long-tseu* (pūga, *areca nut*), 20 *tau-k'au* (nutmegs), an ounce (*tael*) of Camphor, and a *ching* (peck) of Mahāśāli rice. This rice is as large as the black bean, and when

cooked is aromatic and shining, like no other rice at all. It grows only in Magadha, and nowhere else. It is offered only to the king or to religious persons of great distinction, and hence the name kung-ta-jin-mai (i.e., *rice offered to the great householder*).

“Every month he was presented with three measures of oil, and daily a supply of butter and other things according to his need.

“A pure brother (*a Upāsaka*) and a Brahman, relieved from all religious duties, accompanied him with a riding elephant.”⁹⁸

Guests

The biographer winds up this interesting account of the hospitality enjoyed by Hiuen Tsang during his stay at Nālandā with a general remark which implies that the honours done to the Master of the Law formed more or less the norm which prevailed in the great vihāra for the reception and entertainment of guests.

“In the Nālandā convent the abbot entertains a myriad priests after this fashion, for besides the Master of the Law there were men from every quarter; and where in all their wanderings have they met with such courteous treatment as this ?”⁹⁹ Well might a modern commentator ask : “Who would not be the guest of the abbot of the Nālandā monastery with its six wings, each built by a king, all enclosed in the privacy of solid brick ?”¹⁰⁰

Daily Routine

Of the general administrative arrangement in the monastery and the details of daily life and discipline observed by its inmates, we get some very interesting and concrete details in the observations recorded by I-tsing. The officers of the vihāra and their duties are explained in the following passage, which is unfortunately not as full as we should like :

Officials

“All those who have charge of the bolts of the doors take each night the seals with which they seal them and return them to the president; they should not on any account deposit them in the houses of the masters of the temple (*vihārasvāmin*) or the directors

98. *Life*, pp. 105-10.

99. *Life*, p. 110.

100. Cranmer Byng in *Life*, p. ix.

(*karmadāna*). Only those who constitute the monastery are called masters of the temple; their Sanskrit name is *pi-ho-louo-souo-mi* (*vihārasvāmin*). As to those who, in their turn, enforce the rules, guard the doors of the temple, and go to announce the affairs to the assembly of the monks, they are called *pi-ho-louo-po-luo* (*vihārapāla*); the translation of this word is 'guardian of the temple.' As to those who sound the *kienti* (*ghaṇṭā*) and supervise the repasts, their name is *kie-mouo-t'ouo-na* (*karmadāna*); the translation of this word is 'those who assign occupations;' those whom they call *wei-na* speak only in parables."¹⁰¹

Seal

The mention by I-tsing of seals with which the bolts of doors were sealed at night, reminds one of the many sealings of Nālandā vihāra recovered in the excavations and bearing the inscription: '*Śrī Nālandā-mahāvihārīyāryabhikṣu-saṅghasya*' below a wheel flanked by two gazelles, recumbent with head upraised and turned to the wheel.¹⁰² It has remained a puzzle why the wheel and gazelles symbol which represents Sārnāth, the Deer-park where the Buddha first 'turned the wheel of Law' i.e. delivered the first sermon, should make its appearance on a Nālandā seal. The suggestion may be offered that the saṅgha of Nālandā had different seals which were employed for different purposes, and that different sacred symbols were engraved on them to distinguish them from one another, while the inscription which was common to them all identified the seals as those of the particular vihāra. This is only a surmise, to be confirmed or contradicted by the progress of further exploration.¹⁰³ We have to remember that the same symbol is figured in the Pāla royal seal also.

101. *Rel. Em.* pp. 88-9.

102. ASR, EC. 1916-17, p. 43. Also ASR 1916-17, p. 21.

103. Hirananda Sastri's explanation that the idea was to suggest a relation between the Buddha preaching at Sāranāth and the hundreds of bhikṣus preaching at Nālandā is, I think rightly, characterised as far-fetched by Bosch, who also points out that the Buddha images in Nālandā are more often in the Bhūmisparśa mudrā which suggests Bodh-Gayā, rather than Sārnāth (p. 582, n. 128).

Bloch has noticed, however, a large image of Buddha (4ft high) preaching the first sermon attended on the sides by Bodhisattvas Maitreya-nātha and Vasumitra and above by the flying figures of Sāriputra and Maudgalyāyana.

JRAS 1909, pp. 441-2.

Ordination

Regarding the rules of ordination and discipline at Nālandā, I-tsing says that they conformed generally to what he has described in two other works of his, and adds that the superior of the *vihāra* was appointed solely on considerations of age, irrespective of merit :

“The rules concerning the monks and the novitiates of this temple, the statutes on the subject of the renunciation of the world and admission into the order, all conform to what is expounded in the *Tchong-fang-lou* and the *Ki-koei-tchoan*.¹⁰⁴ In the interior of the monastery they are content to take the oldest to give him the presidentship and to make him the venerable superior (*sthavira*); they do not trouble themselves about his merit.”¹⁰⁵

We may also notice in this connection, one detail relating to ordination which I-tsing notes as a special feature of Nālandā in his *Record*, one of the works alluded to by him above:

“But in the Nālandā monastery the priests often receive the Upasampadā ordination (i.e. full ordination) in the early morning, on the *first day* of the ‘long season’ (17th of the 6th moon, see above) when the day has just begun to dawn. They mean to claim seniority among those who are ordained in the same manner.”¹⁰⁶

Seniority

The order of seniority so established among the monks was no empty form, but it governed the order in the annual allotment of residential rooms, and was possibly also otherwise important.

104. I have not been able to find particulars on the *Tchong-fang-lou* of which the name signifies “written on the country of the middle,” that is to say on India. As for *Ki-koei-tchoan* it is the abridged title of the *Nan-hai-ki-koei-nei-fa-tchoan* which signifies “Treatise on the inner law (i.e. Buddhism) sent from the seas of the south.” This work was composed by I-tsing at the same time as the essay we translate, when he was in the country of Śrī Vijaya; he sent it by the monk *Ta-tsin* (§ 56) who returned from the southern seas to Canton and he sent it thus to China; the treatise on the inner law...expounds many points of discipline of the school of Sarvāstivāda; it comprises four chapters divided into forty sections; sections xxxii and xxxiv have been translated into French by M. Ryauon Fujishima (JA 1888).—Chavannes (1894). The whole work is now available as ‘*A Record of Buddhist Religion*’ in Takakusu’s translation, Oxford, 1896.

105. *Rel. Em.* p. 88.

106. *Record*, p. 103.

This is what I-tsing says on the allotment of accommodation every year :

“ Before the Varṣa (Rainy-season) rooms are assigned to each member; to the elders (i.e. Sthavira) better rooms are given, and thus gradually to the lowest. In the monastery of Nālandā such rules are practised at present; the great assembly of priests assigns rooms every year. This is what the World-honoured taught us himself, and it is very beneficial. Firstly, it removes one's selfish intention; secondly, the rooms for priests are *properly* protected.”¹⁰⁷

Meetings

The occasions for summoning general meetings of the monks, the manner of summoning them, and the procedure followed at such meetings where evidently votes were not taken but the greatest measure of general agreement was aimed at, are detailed by I-tsing thus :

“ When the community of monks has a business they convene a meeting for regulating it; the guardians of the temple (vihāra-pāla) have orders to go over the lines (of residences) for announcing it before each person successively; all should join the palms of the hands and each one express his sentiment. If only one person refuses his consent the business cannot be concluded. They do not have by any means the custom of striking a hammer before a meeting for ascertaining the opinion by a show of hands. If they see that some one refuses his consent, they persuade him by argument; they should not use intimidation or violence in order that under the constraint which is inflicted on him he might submit.”¹⁰⁸

Autonomy in Discipline

I-tsing also makes it clear that the inmates of the monastery were autonomous in the mutual enforcement of their own rules of discipline, and not subject to any interference from the State :

“ The spirit of the rules of this temple is very severe and very high. Every fortnight, those who regulate the occupations (karmadāna ?) and the assistant scribes have orders to go round the habitations reading the rules.

“ The names of the members of the community are not inscribed in the royal registers. Those who violate the laws are

107. *Record*, p. 86.

108. *Rel. Em.* pp. 89-90.

punished for their faults by the assembly itself. In this manner the monks and the novitiates are all afraid of one another.¹⁰⁹

Worship

The forms and modes of worship observed in this large establishment may be gathered from the following description of I-tsing :

“ In the Nālandā monastery the number of priests is immense, and exceeds three thousand; it is difficult to assemble so many together in one place. There are eight halls and three hundred apartments in this monastery. The worship can only take place separately, as most convenient to each member. Thus, it is customary to send out, every day, one precentor to go round from place to place chanting hymns, being preceded by monastic lay servants and children carrying with them incense and flowers. He goes from one hall to another, and in each he chants the service, every time three or five ślokas in a high tone, and the sound is heard all round. At twilight he finishes this duty. The precentor generally is presented by the monastery with some special gift (Pūjā). In addition there are some who, sitting alone, facing the shrine (Gandhakūṭi), praise the Buddha in their heart. There are others who, going to the temple, (in a small party) kneel side by side with their bodies upright, and, putting their hands on the ground, touch it with their heads, and thus perform the Threefold Salutation. These are the ceremonies of worship adopted in the West (i.e. in India). Old and infirm priests are allowed to use small mats whilst worshipping. Though, (in China), the hymns in praise of the Buddha have long existed, yet the manner of using them for a practical purpose is somewhat different from that adopted in India (lit. ‘Brahma-rāṣṭra’). The words which begin with ‘Praise be to the signs of the Buddha,’ and are used when worshipping the Buddha (in China) should be intoned in a long monotonous note, and the rule is to proceed thus for ten or twenty ślokas at one time. Further, Gāthas such as the one beginning with, ‘O Tathāgata !’ are really hymns in praise of the Buddha.”¹¹⁰

Water Clocks : Time-keeping

The whole of the daily routine of the vihāra was regulated by the regular announcement of the hours of the day, by means of

109. *Rel. Em.* p. 91.

110. *Record*, pp. 154-56.

a *ghaṇṭā* and the system of measuring time by means of water-clocks is described in considerable detail by I-tsing more than once. Thus in the *Record* he says :

“ Besides, clepsydrae are much used in great monasteries in India. These together with some boys who watch them are gifts from kings of many generations, for the purpose of announcing hours to the monastics. Water is filled in a copper vessel, in which a copper bowl floats. This bowl is thin and delicate, and holds two Shang (prasthas) of water (about two pints). In its bottom a hole is pierced as small as a pin-hole, through which the water springs up ; this hole is to be made larger or smaller according to the time of the year. This must be well set, measuring (the length of) hours.

“ Commencing from the morning, at the first immersion of the bowl, one stroke of a drum is announced, and at the second immersion, two strokes ; at the third immersion, three strokes. But, at the fourth immersion besides four strokes of a drum, two blasts of a conch-shell and one more beat of a drum are added. This is called the first hour, that is when the sun is at the east (between the zenith and the horizon). When the second turn of four immersions of the bowl is done, four strokes (of a drum) are sounded as before, and a conch-shell is also blown, which is followed by two more strokes (of a drum). This is called the second hour, that is the exact (beginning of the) horse-hour (i.e. noon). If the last two strokes are already sounded, priests do not eat, and if any one is found eating, he is to be expelled according to the monastic rites. There are also two hours in the afternoon which are announced in the same way as in the forenoon. There are four hours at night which are similar to those of day. Thus division of one day and one night together makes eight hours. When the first hour at night ends, the sub-director (Karmadāna) announces it to all, by striking the drum in a loft of the monastery. This is the regulation of the clepsydra in the Nālandā monastery. At sunset and at dawn, a drum is beaten (‘one round’) at the outside of the gate. These unimportant affairs are done by the servants (‘pure men’) and porters. After sunset till dawn, the priests never have the service of striking the Ghaṇṭā, nor is it the business of those servants (‘pure men’) but of the Karmadāna. There is a difference of four and five (strokes of the Ghaṇṭā), which is fully mentioned elsewhere.”¹¹¹

111. *Record*, pp. 144-5.

And more briefly elsewhere¹¹² he writes :

“In the region of the five Indias, there are only great temples; the sovereigns have all directed the establishment therein of water-clocks; thanks to this instrument, when the different periods of day or night arrive, it is not difficult to comply with what discipline enjoins. The night divides itself into three parts; during the first and the last, the rules ordain giving oneself up to contemplation (dhyāna) while singing psalms; in the intervening part they do what they like. The explanation of the system of the water-clock conforms to what is expounded in the *Ki-koei-tchoan*.”¹¹³

Bathing

One of the uses of the *ghaṇṭā* was to announce the bathing hour to the monks, and what I-tsing says of the manner of their bathing is as follows :¹¹⁴

“There are more than ten great pools near the Nālandā monastery, and there every morning a *ghāṇṭi* is sounded to remind the priests of the bathing-hour. Every one brings a bathing-sheet with him. Sometimes a hundred, sometimes a thousand (priests) leave the monastery together, and proceed in all directions towards these pools, where all of them take a bath.”

Foreign Visitors

Of the numberless pilgrims and students that visited Nālandā besides the two best known, I-tsing has preserved some names of his contemporaries, and it may not be without interest to reproduce them here with the main facts relating to them as recorded by him :

1. Sramaṇa Hiuen-tchao (Prakāśamati)—spent 3 years at Nālandā (c. A.D. 660) studying under Jinaprabha the Madhyamaka śāstra and the Śata-śāstra.¹¹⁵ Then under Ratnasimha he learned the 17 points of yoga. Met by I-tsing at Nālandā¹¹⁶ where he came again after much travelling in India. He died in Mid-India when he was sixty odd years.

112. *Rel. Em.*, p. 92.

113. The *Ki-koei-tchoan* is no other than the *Record*.

114. *Record*, pp. 108-9. See Cunningham's plan for the pools near Nālandā.

115. *Rel. Em.* pp. 17-18.

116. *Ib.*, pp. 25-26.

2. Tao-hi (Śrīdeva). Dwelt some years in Nālandā studying Mahāyāna. He engraved a tablet in Chinese at Mahābodhi, and wrote (copied?) more than 400 chapters while at Nālandā. Died in India aged over 50.¹¹⁷

3. Ngo-li-yé-po-mouo (Āryavarman), native of Korea. Studied śāstras of discipline and copied sūtras in Nālandā where he died aged 70.¹¹⁸

4. Hoei-yi, of Korea (c. A.D. 638). Lived long in Nālandā for listening to the 'explications' there. I-tsing heard of his death there from the monks of Nālandā. The Sanskrit works he had written (copied?) were all in Nālandā.¹¹⁹

5. Fo-t'ouo-ta-mouo (Buddhadharma) of Tokharestan. I-tsing met him at Nālandā.¹²⁰

6. Tao-cheng (Candradeva), A.D. 649. Studied in Nālandā and was held in great esteem by the prince royal.¹²¹

7. Ta-ch'eng-teng (Mahāyāna Pradīpa). Spent some time in Dvāravatī and Ceylon. Travelled in South India and lived for twelve years in Tāmralipti learning Sanskrit before he arrived at Nālandā with I-tsing. Died at Kuśinagara in the Parinirvāṇa temple, aged over sixty.¹²²

8. Tao-lin (Śīlaprabha). He reached Nālandā by the sea-route and examined the Sūtras and the Śāstras of the Mahāyāna and the Kośas and spent many years there.¹²³ He travelled in Southern and Western India.

9. I-tsing himself. Also read Mahāyāna at Nālandā.¹²⁴ Stayed a year and studied śabda-vidyā-śāstra.¹²⁵ Returned and worshipped the Mūla-gandha koṭi; climbed up the Gṛdhrakūṭa.¹²⁶ Lived ten years at Nālandā and studied the lives of the Saints.¹²⁷ Took with him Sanskrit texts comprising more than 500,000 stanzas.

10. Ling-yun (Prajñādeva). Painted at Nālandā the Maitreya and the Bodhidruma.¹²⁸

11. Tche-hong, nephew of Wang Hiuen-tsé, the Chinese ambassador. In Nālandā he perused and surveyed the texts of the Mahāyāna.¹²⁹

117. *Ib.*, pp. 29-30.

118. *Ib.*, pp. 32-33.

119. *Ib.*, p. 34.

120. *Ib.*, p. 38.

121. *Ib.*, p. 39.

122. *Ib.*, pp. 71-73.

123. *Ib.*, p. 101.

124. *Ib.*, p. 104.

125. *Ib.*, pp. 121-2.

126. *Ib.*, p. 123.

127. *Ib.*, p. 125.

128. *Ib.*, pp. 126-27.

129. *Ib.*, pp. 133, 136-7.

12. Ou-hing (Prajñādeva) (another). Listened to yoga in Nālandā; studied the Kośas and rules of discipline and practised the central contemplation (vipaśyana).¹³⁰ Companion of I-tsing. Died in India.

Besides the dozen names of his time (including his own) thus recorded by I-tsing, there are a few more names of Chinese visitors that may be noted. Ou-Kong, a Chinese monk spent three years at Nālandā (c. A.D. 765-8), and his memoirs, though not as interesting as those of Hiuen Tsang or even Fa-hien, still form a valuable supplement to them.¹³¹ Ki-ye, who travelled in India c. 970 A.D. and has left a compendious description of the state of Buddhism in India in his time, visited Nālandā among other monasteries and noted that all of them had entrances facing West.¹³² During the years A.D. 984-87. T'se-hoan, a monk of the division of Wei, seems to have visited Nālandā, though there is some uncertainty about this, due to the confusion introduced in the names in the text by its Song redactor.¹³³

Influence of Nālandā Abroad

Many doubtless went out from Nālandā to different countries, and particularly to China to assist in the great work of translation of Scriptures from Sanskrit that went on for several generations there. Some of them are mentioned elsewhere in this paper; but our knowledge of them is bound to be relatively meagre.¹³⁴

We have, with the aid of the Chinese pilgrims and the results of archaeological research, tried to gain some idea of what Nālandā was like in the heyday of its splendour, how it grew to be what it became; we have seen that wanton destruction by a ruthless invader extinguished its great light for ever. There are many gaps in our knowledge, some of which one hopes may yet be filled by the further progress of research. Of all the centres of learning in Ancient and Mediaeval India, and these were many scattered all over the land, we have most data about Nālandā, which was the greatest of such centres, not only for the study and spread of Bud-

130. *Ib.*, p. 145.

131. JA : 1895, Sep.-Oct. p. 358.

132. BEFEO, ii, p. 259.

133. Chavannes : *Les Inscriptions Chinoises de Bodh Gayā*, App. xiv.

134. See Nos. 7, 16, 51 of Appendix I, and 154 and 159 of Appendix II of Nanjio, *Catalogue*, Also *Journal of the Madras University*, xii, pp. 187-92.

dhism in its various phases, but for the pursuit of all Indian religious and philosophical systems. The history of the University of Nālandā practically spans a whole millennium, a period of wonderful and sustained endeavour and achievement in the realm of the spirit.

Buddhism in Nālandā

But when all is said, Nālandā is important more as a centre of Buddhism and for the tremendous influence it exerted on the thought and religion of the Eastern countries than for anything else. It is therefore necessary before we close this study to seek to determine with some precision the role of Nālandā in the evolution of Buddhist thought and practice in the four or five centuries during which it held the position of the most renowned world-centre of Buddhism. For Tibet during the middle ages Nālandā was enveloped in a mysterious haze of holiness; it was the source of all knowledge. Tāranāth traces all that is good in Mahāyāna in his estimation, its famous teachers, sacred texts and doctrines, its most celebrated reformers, all to Nālandā without any hesitation. This seems to be borne out also by the data furnished by Hiuen Tsang who says that all the bhikṣus studied the Mahāyāna at Nālandā, and counts Dharmapāla, the pupil of Dignāga and famous divine of the Yogācārya school of Asaṅga, and his own teacher Śīlabhadra from whom he heard an exposition of the Yogācārabhūmiśāstra, among the holders of the highest place in Nālandā. Again, of the texts collected by him and translated under his supervision, the bulk must have been doubtless obtained at Nālandā; and among them we find only seventeen titles belonging to the Hīnayāna while not less than fifty-eight books are Mahāyānist texts, some of which fall to be classed among Tantric texts like *Vajrapracchedika Prajñāpāramitā*—the chief scripture of mantra-Buddhistic Shin-gon-shu in Japan, the *Amoghapāśahrdaya*, and so on.¹³⁵

Mahāyāna and Hīnayāna

I-tsing, however, who belonged himself to the Hīnayāna school of Mūlasarvāstivādins, makes the categorical statement: "In Northern India and the islands of the Southern Sea, they generally belong to the Hīnayāna,"¹³⁶ and Takakusu in his summary of I-tsing's introduction has noted that according to him the Ārya-mūlasarvāsti-

135. Bosch, p. 537 and Nanjio, *Catalogue*, p. 435.

136. *Record* p. 14.

vāda-nikāya was most flourishing in Magadha i.e. the region of Nālandā.¹³⁷ And we have seen above that I-tsing devotes particular attention to the rules of discipline prevailing in the Nālandā Vihāra, and there is no reason for us to think that the ten years he spent at Nālandā were anything but a very pleasant period of his life spent among most acceptable spiritual companions who had the same outlook as himself in matters of religion.

I-tsing surely knew what he was speaking about and made no mistake; and it is unlikely that in the short interval between Hiuen Tsang's departure and the arrival of I-tsing there was any wholesale change over from Mahāyāna to Hīnayāna; in fact, the whole trend in Buddhist history is the other way about. The truth of the matter is that it is wrong to postulate any sharp difference between the two main yānas of early Buddhism which were closely bound together by many subtle bonds from the beginning;¹³⁸ and apparently it was quite possible for the same set of facts to be described in such different words as Hiuen Tsang and I-tsing adopt about Nālandā, each naturally selecting and stressing the features that struck him as the most significant. Krom has pointed out admirably how, with the development of the eclectic and idealist philosophy of the Yogācāra school under the leadership of Asaṅga, even such distinction as was once recognised between Hīnayāna and Mahāyāna steadily lost its significance. He says:¹³⁹ "The masters of the Yogācārya had already given the example; not following *one* system but drawn from all creeds, was the doctrine expounded by Asaṅga, so that the śrāvakas (Hīnayānistic monks) became believers, and it is expressly related of Vasubandhu that he had studied the śāstras of the eighteen sects, the points of difference between sūtras and vinaya of the various schools and even the chief works of the Tīrthyas. We have already seen above, that according to I-tsing the same sect belonged in one place to the Hīnayāna and in another to the Mahāyāna, while the same author further mentions as the only systems of the Mahāyāna the two great schools of philosophy, Mādhyamika and Yogācārya. It is thus clearly proved how much the distinctions between the sects had been pushed aside by the schools of philosophy in the Church. The particular tenets of the sects lost their meaning except in so far as they found a place as fundamental principles in one of the systems of philosophy."

137. *Ib.* p. xxiv.

138. JA 11:8 (1916) p. 28 cited by Krom and Bosch.

139. *Barabudur* ii, pp. 327-8.

We have seen already that Hiuen Tsang's own studies were not confined to Yogācārya texts but included some Hīnayāna texts, and even Brahminical śāstras. We can well understand, as Bosch has observed,¹⁴⁰ that in the midst of men who did not despise the study of Hīnayānist texts though they professed Mahāyāna as their creed, I-tsing might have felt quite at home, and when he recorded his impression that the Sarvāstivādins counted the largest number of followers in Magadha, he might have had in mind considerable numbers of sects which nominally belonged to the Hīnayāna but studied Asaṅga's system quite as much as the declared Mahāyānists. I-tsing himself was far from being a narrow Hīnayānist, and among the books he took with him from India to China, nearly one half were Mahāyāna texts, and some were definitely Tantric in character and included a number of Dhāraṇīs.¹⁴¹

Tantrayāna

In fact, a new Tantrayāna was growing out of the Yogācārya system at this period in Nālandā, and this new development did not take place without opposition. Discussing this very problem of the relation of the Tantrayāna to Yogācārya system in the Buddhism of Barabudur, Krom has rightly observed:¹⁴² "The evolution of religion and philosophy does not take place in such a way that at some given moment we can draw a line at the point where an old opinion is unanimously dropped and a new one taken up. The one glides unperceived into the other and gradually the believer's mind becomes ripe for new ideas, accepted first by a few, then by more and finally by the majority." We have many indications besides those already noted that Buddhism in Nālandā was passing through this type of transition in the seventh and eighth centuries A.D.¹⁴³ We have a curious and significant incident narrated by the biographer

140. p. 540.

141. *Rel. Em.*, pp. 194-6.

142. ii. p. 331.

143. P. Mus (BEFEO xxxii p. 328 and n. 1) citing A. K. Coomaraswami expresses the opinion that Nālandā's role in the history of Buddhist thought and practice was not so great as Bosch and Stutterheim would make it, and that Nālandā only relayed the developments that took place in Kashmir and transmitted them to the countries of the Far East. I am unable to share this belief in the face of the volume of evidence relating to Nālandā, and the relative paucity of our knowledge regarding Kashmir Buddhism. Vīradēva went from Peshawar to Nālandā to attain the crown of his career. See *Ante* p. 166.

of Hiuen Tsang which deserves attention here :¹⁴⁴ “ Silāditya-rāja had constructed a Vihāra covered with brass plates by the side of the Nālandā monastery, about a hundred feet in height. It was renowned through all countries.

‘ *Sky-flower* ’ Doctrine

“The king after returning from the subjugation of Konyodha (Ganjam?) came to Orissa. The priests of this country all study the Little Vehicle, and do not believe in the Great Vehicle. They say it is a system of the “sky-flower” heretics, and was not delivered by Buddha.

“When they saw the king after his arrival, they entered into conversation and said : ‘ We hear that the king has built by the side of the Nālandā convent a Vihāra of brass, a work magnificent and admirable. But why did not your majesty construct a Kāpālīka temple, or some other building of that sort ’ ?

‘ The king answered : ‘ What mean you by these words of reproach ? ’

In reply they said : ‘ The Monastery of Nālandā and its ‘ sky flower’¹⁴⁵ doctrine is not different from the Kāpālīka sect: this is our meaning.” We seem to have a clear indication here that Mahāyāna at Nālandā was moving in the direction of Tantrayāna, not unmixed with Śaivism.

Tibet: Origin of Lamaism

Tāranātha attributes to Nālandā, as we have seen, the greatest influence on the growth and spread of Buddhism in many lands. In the first half of the eighth century Śānta-rakṣita, Padmasambhava, and Kamala-śīla, famous teachers of Nālandā, the two latter being teachers of Tantras, were invited to Tibet by king Kri-sring-deutsan (A.D. 728-786) : they are said to have succeeded in founding the Lamaist church there and thus displaced the older state religion.¹⁴⁶ This Tibetan tradition is a further unmistakable proof of the Tantric direction taken by Buddhism at Nālandā after the seventh

144. pp. 158-59.

145. The *sky-flower* doctrine is fully explained in the Surāṅgama Sūtra. It was evidently a doctrine developed in the Nālandā monastery, as this Sūtra was framed there. The doctrine is simply that all objective phenomena are only, like *sky-flowers*, unreal and vanishing—Beal.

146. Vidyabhusan, *Indian Logic*, pp. 323 and 327 ; Bosch p. 543. Sankalia, pp. 117-20.

century. We must also note the remarkable expressions in the Nālandā copper-plate of Devapāladeva by which all the ārya bhikṣus are held to be a group of Tāntrika-bodhisattvas: *tāntrika-bodhisattvagaṇasya... caturddiśāryabhikṣusaṅghasya*. "From this it is clear," says Bosch, "not only that the bhikṣus had become Tantrists, but Mahāyānist Bodhisattvas, once held in great honour, had served their purpose, and a new generation of Tantric deities had been elevated to the throne."¹⁴⁷ The same writer draws attention to the evidence from the Chinese translations of Buddhist texts pointing in the same direction, and confirming the conclusions indicated so far. In the seventh century Hīnayāna texts still formed a considerable part of the books brought by pilgrims from Nālandā to China; but all the texts translated in the eighth century by Śubhakarasiṃha (716-35 A.D.), a śramaṇa who went to China from the Nālandā monastery,¹⁴⁸ were Mahāyānist texts; finally, in the tenth century, of the 118 books translated by Dharmadeva *alias* Fa-hien (973-1001), also an arrival from Nālandā in China, about a hundred were productions of the Tantrayāna.¹⁴⁹

Kāla-cakra-yāna

There was one more step taken by Nālandā Buddhism before its final disappearance. This seems to have occurred towards the end of the tenth century when Kāla-cakra Buddhism was received into Nālandā. This creed of mysterious origin was suffused with Vaiṣṇavism, and the story of its introduction into Nālandā is described in a Tibetan work of the sixteenth century. In the rendering of Cṣoma de Koros, the story reads as follows:¹⁵⁰ "He (a certain pandit called Tsilu or Chilu) then came to Nālandā in Central India, (S. Madhya). Having designed over the door of the *Bihar* the ten guardians (of the world), he wrote below them thus:

'He that does not know the chief first Buddha, (*Ādi-Buddha*), knows not the *circle of time* (*Kāla-Chakra*).

'He, that does not know the circle of time, knows not the exact enumeration of the divine attributes.

'He, that does not know the exact enumeration of the divine attributes, knows not the supreme intelligence (S. *Vajra dhara jñāna*).

147. pp. 543-4.

148. Nanjio *Catalogue*, p. 444.

149. *Ib.*, p. 450.

150. JASB ii (1833) pp. 57-8.

‘He, that does not know the supreme intelligence, knows not the Tantrika principles (*Tantra Yānam*).

‘He that does not know the Tantrika principles, and all such, are wanderers in the orb of transmigrations, and are out of the way (or path) of the supreme triumphator (S. *Bhagavān Vajra dhara*).

‘Therefore, *Ādi-Buddha* must be taught by every true b-Lama (S. *Guru*, a superior teacher, religious guide), and every true disciple who aspires to liberation (or emancipation) must hear them.’ Thus wrote he :

“The venerable (the Lord) Narotapa (Narottama?) being at that time the principal (S. *Upādhyāya*) of the *Bihar*; he together with five hundred pandits, disputed with him, but when they saw that he excelled them all in disputing, they fell down at his feet, and heard of him *Ādi-Buddha*; then this doctrine was much propagated.”

Thus Nālandā accepted a creed which had nothing in common with Buddhism of old except the name. This change over to forms of belief and practice which differed little from the surrounding Śaivism and Vaiṣṇavism of the land, and these in some of their most degenerate forms, must have contributed not a little to the weakening of the distinct position that belonged to Buddhism before this change. Henceforth Buddhism loses its identity and mingles with the incoherent mass of popular beliefs and superstitions characteristic of the vulgar side of Hinduism.

Influence in the Islands

The chief stages in the transformation of Buddhism at Nālandā were reflected in ‘the kingdoms of the Southern Seas’ as the Chinese called them, which, as we have seen, maintained a constant intercourse with Nālandā. In the splendid article on the Nālandā copper-plate of Devapāla, to which we have referred so frequently before, Bosch has gone into this question at some length, and we could do no better than present his main conclusions in his own words:¹⁵¹ “putting side by side the important moments in the History of the monastery of Nālandā and those in the history of Buddhism in the Archipelago, we see that the path followed by religion at Śrīvijaya, and later in Java, runs parallel with the line of development that Buddhism takes at Nālandā.Buddhism enters

151. Pp. 553-5 (Translated from the Dutch original).

Śrī Vijaya after the rise of the great monastery. The period of the finest bloom of Nālandā (seventh century) is also the time when the University of Palembang attains great lustre. The gradual changes of opinion regarding the true doctrine, starting from the Hīnayāna and proceeding along the Mahāyānist Yogācārya to a further stage of Tantrism already highly coloured by Śaivism, and ending in a fully degenerate Bhairava-cult, these shiftings we see repeated at Śrī Vijaya, and later in Java, in the same order and with the same tempo.¹⁵² Only on one point is there a difference to be noted; while the role of Nālandā is irrevocably played out after the end of the twelfth century, Buddhism in Java has still before it some centuries of comparative prosperity."

In one respect perhaps these observations of Bosch, made in 1925, need a slight amendment in the light of more recent researches; the large stone Buddha of Bukit Seguntang in Palembang raises a strong presumption that the introduction of Buddhism there must have occurred much earlier than Bosch suggests, and most probably from the region of the Kṛṣṇā delta. But the later influence of Nālandā on the Archipelago is undeniable, and Bosch's estimate of it may well be accepted as substantially correct.

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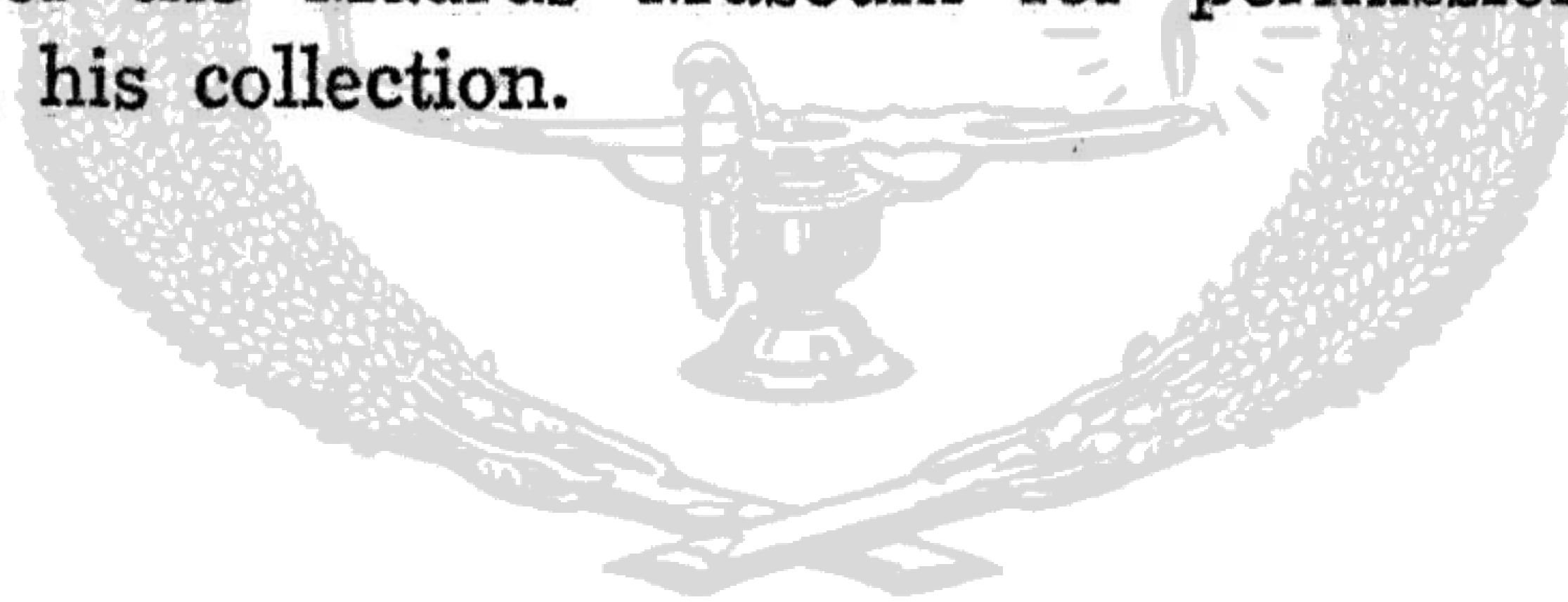
152. I have gone into this question in some detail in a forthcoming paper on Śrī Vijaya.

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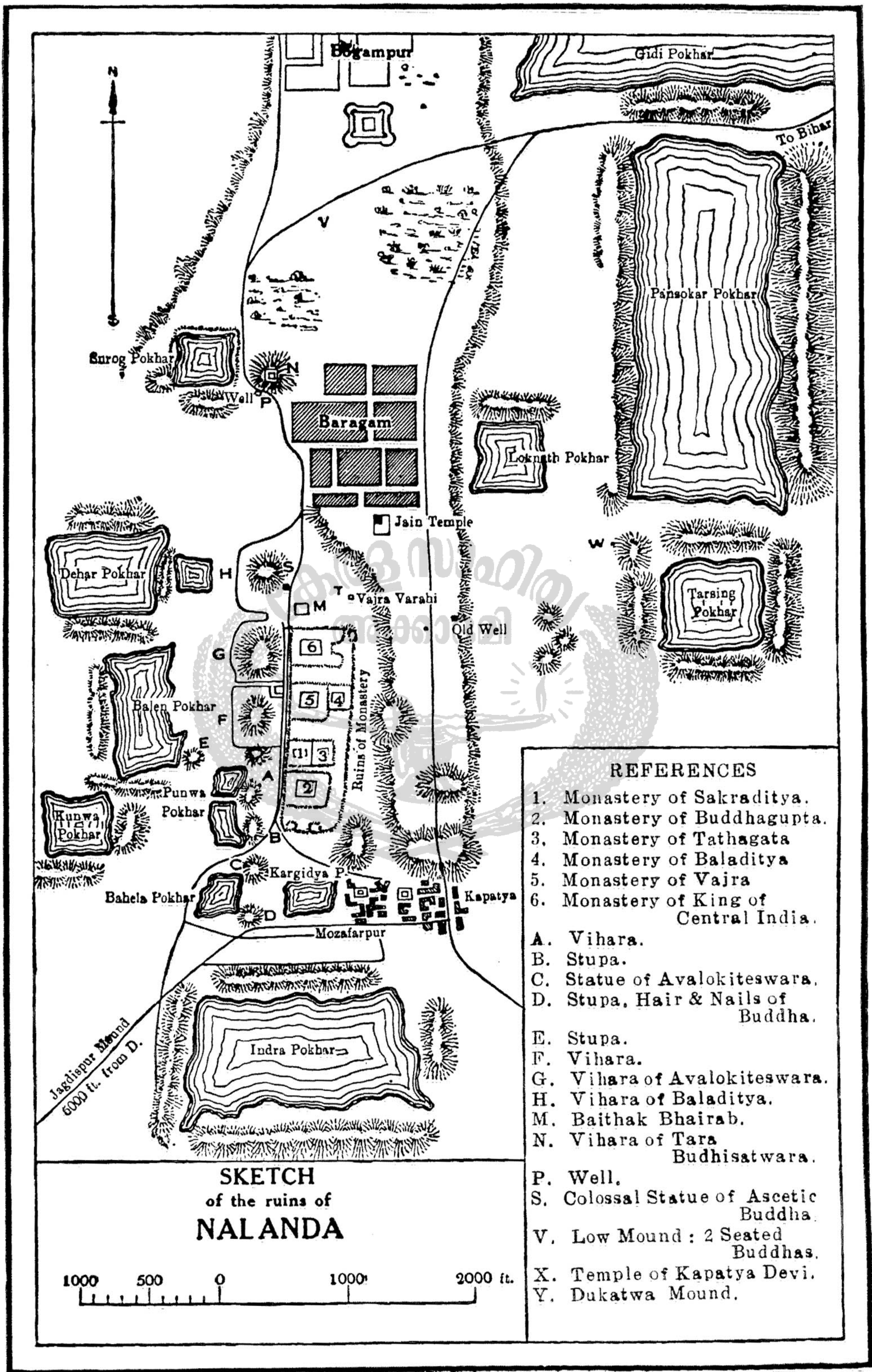


Fig. 1.—Plan of Site, after Cunningham.



Fig. 2.—Bronze image of Buddha
(ASI 1917-18, Pl. XIV-a).



Fig. 3.—Bronze Yamāntaka (p. 169) (ASI. CC. 1920-21, Pl. 1).

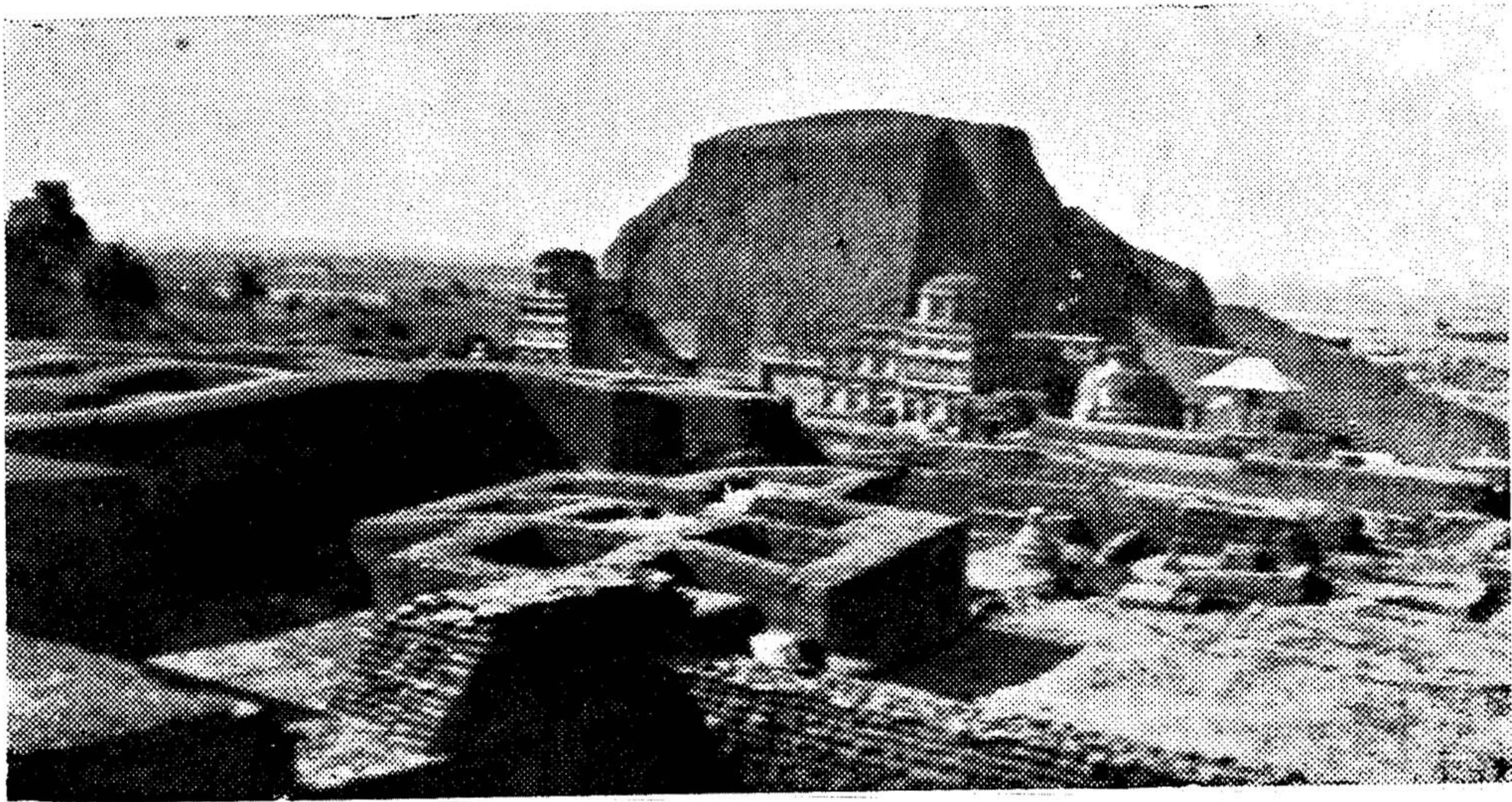


Fig. 4.—Excavations—General View.
—Photo by Dr. S. Paramasivan



Fig. 5.—An early stucco figure
(p. 171)
—Photo by Dr. S. Paramasivan

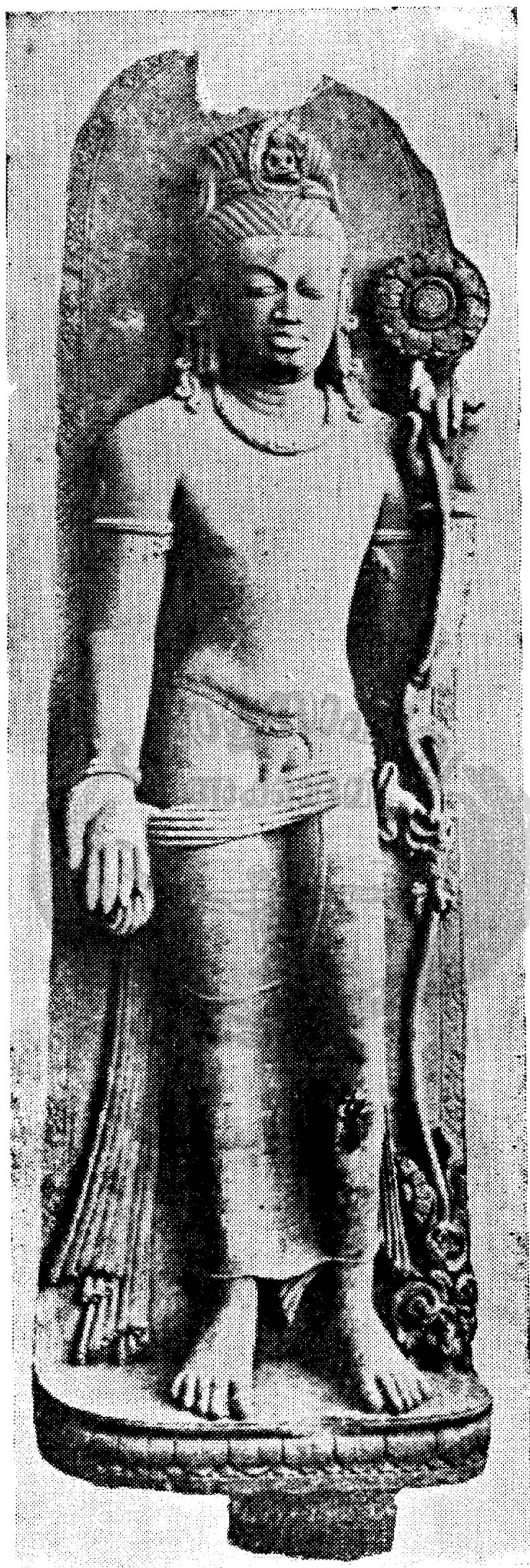


Fig. 6.—Avalokiteśvara—p. 171
(ABIA 1934, Pl. II-a)



Fig. 7.—Inscribed stone Buddha in Dharmacakia mudrā—JRAS 1909 p. 441. (ASI. CC. No. 4309)

*SOME PROBLEMS IN PĀṆINI

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I. Itah

Macdonell's¹ view that 'it' is an abbreviation of 'iti' (meaning 'thus', i.e. an indicatory letter) does not seem to be correct; for, though a Pratyāhāra formed with an It indicates certain letters, an It by itself cannot do so; otherwise the other member of a Pratyāhāra would also on that score be called an It. Further, the contraction does not save anything and Pāṇini would not have resorted to it: 'उपदेशेऽजनुनासिक इति' is not much longer than 'उपदेशे-
ऽजनुनासिक इत् ।'

The important difference between the two members of a Pratyāhāra is that while the first stands, the second disappears. It is to emphasize this difference that the second member has been given by Pāṇini the name It which means 'that which goes' or 'that which disappears'. This is the traditional view which is given in the Śabdaratna as follows :

२न च लोपाभावे इदिति महासंज्ञाकरणात् संज्ञापि नेति वाच्यम् । महासंज्ञयैव
लोपसिद्ध्या तस्य लोप इत्यस्य वैयर्थ्यापत्तेः ॥

Bhairavī : इदिति त्वेतीतीतीदित्यर्थकामिति लोपो भविष्यतीत्याशयः ।

According to the traditional view, It is thus a Mahāsamjñā. If Pāṇini intends it to be only a Laghusamjñā, i.e. a monosyllabic symbol, we may attempt to give some explanation. Here is a suggestion.³

*Extract from my thesis approved for the M.O.L. degree by the Madras University.

1. A Sanskrit Grammar, Introduction, p. 9.

2. Part I, p. 26 (Kāśī Sanskrit Series).

3. For many points contained in this I am much indebted to my revered Professor Dr. C. Kunhan Raja.

As Pāṇini uses both vowels and consonants as Its, he wants to adopt a symbol consisting of both. He takes इ and not अ because, as is revealed on a close examination, the latter, i.e. अ nowhere occurs as an It having a technical purpose. We have आदित् (P. 7.2.16), इदित् (7.1.58), ईदित् (7.2.14), उदित् (1.1.69), ऊदित् (7.2.44), ऋदित् (7.4.2), ॠदित् (3.1.55), एदित् (7.2.5) and ओदित् (8.2.45); but not अदित् anywhere.

Among consonants he selects त् probably for the following reasons. He does not take क् because इक् occurs as a Pratyāhāra in P. 1.1.3 etc. He rejects ख and घ because he does not usually give the Mahāprāṇas as Its. Even in a few instances like खमुच् (P. 3.4.25), खञ् (3.2.28), घञ् (3.3.16), घुरच् (3.2.161), etc., where they are given as Anubandhas, they occur only at the beginning of the grammatical elements and not at the end. It must also be noted that none of the Pratyāhārasūtras have Mahāprāṇas as Its; and this is probably because a Mahāprāṇa is more difficult than an Alpa-prāṇa to pronounce at the end of a word. There is also the fear that a Mahāprāṇa may not remain there as such, but may be changed to the corresponding Alpa-prāṇa (Cf. P. 8.2.39 etc.). For similar reasons Pāṇini does not give Tṛtīyas as Its except इ. Even in the case of इ it may be noted that like the Mahāprāṇa Anubandhas noted above, it never occurs at the end of a grammatical element as an It. इ occurs as an It in the following instances:—

डच्, डट्, डण्, डतमच्, डतरच्, डति, डा, डाच्, डाप्, डु, डुपच्, डमतुप्, ड्य, ड्यण्, ड्यत्, ड्या, ड्रल्, ड्रुन्।

He rejects ह् because इह् occurs as a root and is likely to create confusion in instances like इह् धार्योः शत्रुकृच्छ्रिणि (P. 3.2.130). च् is not selected because इच् occurs as a Pratyāhāra (P. 6.1.104, etc.). छ, ज् and झ are rejected for the reasons already stated above. इन् occurs as a termination in 4.1.95, etc. इट् occurs as an Āgama in P. 7.2.36 etc. ठ, ड and ढ are not taken for the reasons already stated. इण् occurs as a Pratyāhāra in P. 8.3.39. It is त् which thus remains in this process of elimination and which appropriately forms the symbol इत्।

*Its and their various technical purposes.*⁴

आ P. 7.2.16

इ 7.1.58

ई 7.2.14

उ 7.2.56

ऊ 7.2.44

ऋ 7.4.2

ए 7.2.5

ओ 8.2.45

क 1.1.46; 1.1.5; 6.1.15ff; 6.1.39; 6.1.15; 6.4.19ff; 6.4.24;
6.4.34; 6.4.37; 6.4.42ff; 6.4.63; 6.4.66; 6.4.98; 6.4.109ff;
6.4.120ff; 7.4.22ff; 7.4.40ff; 7.4.69ff 2.4.36; 7.2.11ff; 6.1.165;
7.2.118

ख 6.3.66

घ 7.3.52

ङ 1.3.12; 6.1.186; 1.2.1ff; 3.4.103; 7.2.81; 1.1.5; 6.1.16;
6.4.15; 6.4.19ff; 6.4.24; 6.4.34; 6.4.37; 6.4.42ff; 6.4.63ff;
6.4.66ff 6.4.98ff; 6.4.109ff; 7.4.32ff; 3.4.99ff; 1.4.6.

च 6.1.163ff.

ज 1.3.72; 1.2.1; 7.2.115ff; 7.3.32; 7.3.54; 6.1.197; 4.3.155;
2.4.58.

ट 1.1.46; 3.4.79; 4.1.15;

ड 6.4.143; 6.4.142;

ण 1.2.1; 7.2.115ff; 7.3.34ff; 7.1.91; 3.32.54; 3.32.33; 72.117;
7.1.90; 7.1.92.

त 6.1.185.

थ 6.1.197; 6.2.50.

द 3.1.4; 3.4.87; 3.4.86; 3.4.93; 1.2.4; 7.3.89ff; 7.3.87;
7.3.93ff; 7.3.99ff; 6.1.192; 6.1.71.

ध 6.4.92; 6.4.93; 1.1.47.

न 6.1.217.

4. Where there are more than one reference, each relates to a separate purpose.

ल 6.1.193.

श 1.1.153; 3.4.113; 3.3.60ff; 6.1.45; 7.3.75ff; 3.3.104; 4.1.4.

ष 3.3.104; 4.1.4.

स् 1.4.16.

Its have been defined by Pāṇini in the following Sūtras :—

उपदेशेऽजनुनासिक इत् ।

हलन्त्यम् ।

न विभक्तौ तु स्माः ।

आदिर्जिटुडवः ।

षः प्रत्ययस्य ।

चुट् ।

लशक्तद्धिते । (1.3.2-8)

The Its can be divided broadly into four classes :—

1. Its as explanatory elements.

2. Its as phonetic elements, i.e. those of which the purpose is only to aid enunciation. This is according to Nāgeśa. According to other commentators, Mukhasukhārthas are not Its. Perhaps Pāṇini also does not intend to include them among Its; for we have seen that in adopting a symbol for Anubandhas, he does not take अ because it is nowhere used by him as an It having a technical purpose: according to him only those which are employed for technical purposes are Its.

3. Its which serve a double purpose.

4. Its which serve to distinguish one grammatical element from another.

Those which have technical meanings may be called explanatory, e.g., ण् in the Pratyaya अण् which indicates the Vṛddhi of its base. Instances of this class are numerous.

Those which do not imply any technical meanings, but only help enunciation may be called phonetic elements, most of them

being vowels inserted between consonants. Bhaṭṭoji Dīkṣita gives the following instances :—

⁵औतस्तकार उच्चारणार्थः। ⁶इकारस्तूच्चारणार्थः। ⁷पकारोपर्यकार उच्चारणार्थः।

In his commentary on P. 7 1. 86 Haradatta says : स्थान्यादेशे च तपरकरणं मुखसुखार्थम् ।

The अ between the consonants in अकङ् (4.1.97), अनङ् (7.1.75), अयङ् (7.4.22), आनङ् (6.3.25) इनङ् (4.1.126), etc., इ in अनिच् (5.4.124), असिच् (5.4.122), इमनिच् (6.4.154), तसिल् (5.3.7) etc., and उ in अतसुञ् (5.3.28), इणुक् (5.2.53) इनुण् (3.3.44), कृत्वसुच् (2.3.64), कसुन् (3.4.17), etc., are all Mukhasukhārthas.

*Its which serve a double purpose :—*In the terminations matup (5.2.94), ḍmatup (4.2.87), atrn (3.2.104), īyasun (5.3.57), tr (6.4.127), trc (3.3.169), trn (3.2.135), vatup (5.2.39), etc., अ and ऋ not only help enunciation, but by being Anubandhas, also promote the operation of such Sūtras as उगितश्च (4.1.6), उगिदचां सर्वनामस्थानेऽधातोः । (7.1.70), etc.

*The अ in लृण् of the Akṣarasamāmnāya :—*Whether the अ in the Sūtra लृण् of the Akṣarasamāmnāya is a simple Mukhasukhārtha vowel or an anunāsika vowel (i.e. according to the rule उपदेशेऽजनुनासिक इत्, an Anubandha by which a Pratyāhāra, namely ra [standing for r and l] can be formed) is a question which receives much controversial attention in later commentaries. There is in fact nothing of an evidence in the Munitraya texts to regard this as anything more than an ordinary Mukhasukhārtha vowel. The idea of having a Pratyāhāra of 'r' with this 'a' seems to have suggested itself first to Bhartrhari who commenting on the Mahābhāṣya

⁸लृकारस्य लपरत्वं वक्ष्यामि तच्चावश्यं वक्तव्यम् ।

5. Praudhamanoramā, p. 366 (Kāśī Sanskrit Series).

6. Ibid, p. 400.

7. Ibid, p. 165

8. 1.1.9, V. 5.

says :

⁹व्याख्यास्यामीत्यर्थः । कथम् ? प्रत्याहारे रट् लण् इति लकारे योऽकार असावनुनासिकः प्रतिज्ञास्यते ।

From the expression प्रतिज्ञास्यते it must be obvious to discerning minds that Pāṇini does not give it as a nasal. Kaiyaṭa takes for granted that it is an Anunāsika, and in his explanation of the above Mahābhāṣya he goes one step forward—from Pratijñā to Vyākhyāna. Says he:

¹⁰व्याख्यास्यामीत्यर्थः । रपर इत्यत्र र इति लणिति लकाराकारेण प्रत्याहार आश्रीयते । तत्रान्तरतम्यादकारस्याण् रपरः । लृकारस्य लकारः ॥

¹¹Bhaṭṭoji rows in the same boat with Bhartrhari and Kaiyaṭa.

Nāgeśa's criticism :—¹²At Nāgeśa's hands the above view meets with the refutation which it deserves. His criticism may be summarized as follows :—

In the first place, if the अ in लण् is an Anunāsika which can form a Pratyāhāra, Pāṇini who always wants to secure economy in expression, would certainly have the Pratyāhāra 'ra' in lieu of र् in 7.2.2. and 'ya' in lieu of यण् in 6.1.77, etc. Secondly, the Śloka-vārtika.

¹³प्रत्याहारेऽनुबन्धानां कथमज्ग्रहणेषु न ।

raises and answers the question why such augments as ṇ, k, etc., which are read among vowels, i.e. Acs are not taken as such (as Svaras); but neither Kātyāyana nor Patañjali raises a similar question regarding the 'a' in the aphorism लण्, which is read among the consonants. If it is an Anubandha like k or n, such a question must have been raised and answered. The third point against it is this : A probans pointed out by Patañjali to infer the

9. Bhāṣyapradīpikā, Adyar Library Transcript, No. 39 G. 17, p. 402.

10. Vol. I, p. 226 (Nirnayasagar ed.).

11. See the S. Kaumuḍi on P. 1.3.2.

12. Laghuśabdenduśekhara, Part I, pp. 9 sq. (Kāśī Sanskrit Series).

13. See the Mahābhāṣya on ह्यवरट्

non-denotation of the consonant Anubandhas by the Pratyāhāra Ac is ¹⁴ लोपश्च बलवत्तरः, i.e. the obligatoriness of the elision of these. If the 'a' in लृण् is taken as an Anunāsika, i.e. an Anubandha, there would be partial non-establishment of the pervasion of the subjects by the probans which would vitiate the inference. The proposition is this:

अनुबन्धव्यवहारयोग्याः प्रत्याहारजन्यबोधाविषयाः बलवत्तरलोपप्रतियोगित्वात् ॥

We cannot have the Ac-Pratyāhāra before having the Hal-Pratyāhāra; for it is only after interpreting the rule हलन्त्यम् (1.3.3) that we are able to interpret the rules आदिरन्त्येन सहेता (1.1.70) and तस्य लोपः (1.3.9) on which depends the formation of the Pratyāhāra Ac: the term It in the latter rules cannot be understood without the former. So much so, when we are at a stage of deciding what is meant by Hal, the 'a' in the aphorism लृण् cannot be elided as an Anubandha, the elision being known only by the rule तस्य लोपः which has yet to be interpreted. Thus the 'a', one of the subjects of our proposition, is not pervaded by the Hetu बलवत्तरलोपप्रतियोगित्व । Consequently (when not elided) it becomes a consonant; and the undesirable result of this would be the elision of 's' in such instances as सोऽस्ति etc., according to

एतत्तदोः सुलोपोऽकोरनञ्समासेऽहल् । (6.1.134)

etc. Hence Nāgeśa thinks that this 'a' in the aphorism लृण् is only a Mukhasukhārtha.

*The inclusion of Mukhasukhārthas among Its :—*We have here included Mukhasukhārthas among Its; but it may be noted that there is a difference of opinion regarding this among later commentators. All of them except Nāgeśa do not accept them as Its. According to Nāgeśa,¹⁵ they cannot be dropped if they are not Its. He has the following Vārtika and Mahābhāṣya to support him.

14. See the Mahābhāṣya on हयवरट्

15. *Op. cit.*, Part I, pp. 407-408, and the Mahābhāṣya on 6.1.185.

तित्स्वरितम् । (P. 6.1.185)

Kātyāyana : तितिप्रत्ययग्रहणम् ।

Patañjali : तिति प्रत्ययग्रहणं कर्तव्यम् । इह मा भूत्—ऋत इद्धातोः
(7-1-100) किरति । गिरति । तत्तर्हि वक्तव्यम् । न
वक्तव्यम् । नैष तकारः । कस्तर्हि ? दकारः ॥
अद्भुतरादिभ्यः पञ्चभ्यः । (P. 7.1.25)

Kātyāyana : अद्भावे पूर्वसवर्णप्रतिषेधः ।

Patañjali : अद्भावे पूर्वसवर्णस्य प्रतिषेधो वक्तव्यः । कतरत्तिष्ठति ।
कतरत्पश्यति ।

Kātyāyana : सिद्धमनुनासिकोपधत्वात् ।

Patañjali : सिद्धमेतत् । कथम् । अनुनासिकोपधोऽच्छब्दः करिष्यते ।

If the Mukhasukhārtha 't' of 'it' in P. 7.1.100 is not an It, there is no possibility of P. 6.1.185 applying to such instances as किरति गिरति, etc., and Kātyāyana's emendation तिति प्रत्ययग्रहणम् thus becomes unnecessary; we have therefore to infer that both Kātyāyana and Patañjali regard even Mukhasukhārthas as Its; otherwise the operation of P. 6.1.185 could have been prevented in these instances simply by saying that the 't' is only a Mukhasukhārtha and not an It.

In the second instance Kātyāyana and Patañjali take the 'a' of 'ad' as an Anunāsika in order to drop it as an It. The Savarna-dīrgha is thus prevented in katarad (katara+ad). If Mukhasukhārthas can be dropped without being Its, there is no need to regard this as an Anunāsika, i.e. an It. Here it must be remembered that even Nāgeśa includes the Mukhasukhārthas among Its only when they (Mukhasukhārthas) are Vidheyas and not Anuvādyas because it is only in the former case that one of the conditions to be called Its, namely व्यवसितान्यत्व is obtainable.¹⁶

16. For further information on this subject see the L. S. Śekhara, Part I, pp. 408 sq. cf. the Mahābhāṣya on 1.3.3 :

व्यवसितान्यो हलित्संज्ञो भवतीति वक्तव्यम् ।

Its which distinguish one grammatical element from another:— In a few instances Its serve to distinguish one grammatical element from another. For instance, the 'i' of 'ñasi' (4.1.2) differentiates the suffix from 'ñas' (4.1.2); the Anubandha 'i' of 'ini' (3.2.93) differentiates the termination from 'in' (3.2.24); 't' differentiates 'ant' from 'an' (4.1.2).

'g' as an It:—It may be noted here in passing that neither Pāṇini nor Kātyāyana gives 'g' as an It. A Śloka-vārtika quoted and commented upon by Patañjali in the Mahābhāṣya on 3.2.139 gives it. It is accepted by Patañjali. Apart from this we do not have any remarkable addition to the list of Its by Patañjali.

* * * * *

II. The authorship of the Akṣarasamāmnāya

The next problem in Pāṇini that deserves to engage our attention here is the one relating to the authorship of the Akṣarasamāmnāya. We cannot entertain any reasonable doubt regarding the authorship of this Ānupūrvī, i.e. Samāmnāya, which displaying amply the resourcefulness of the master genius Pāṇini, itself places this beyond doubt; yet some evidence has to be adduced here in order to make it clear that the legend which says that this Samāmnāya is a revelation to Pāṇini from Śiva is not a very old one and that neither Kātyāyana, Patañjali, nor Bhartṛhari knows it. It would further interest us to know the source of this legend and to see how later commentators in their enthusiasm for making the Samāmnāya a Śruti tamper with certain texts.

Pāṇini's authorship of the Akṣarasamāmnāya is clearly borne out by the following evidence.

1. Explaining the Vārtika व्याख्यानाच्च द्विरुक्तिः (Vol. I, p. 130 N. S. ed). Patañjali says:—

एतज्ज्ञापयत्याचार्यो भवत्येषा परिभाषा—व्याख्यानतो विशेषप्रतिपत्तिर्न हि सन्देहादलक्षणम् ।

By the term Ācārya he should, as in various other places, here also mean Pāṇini. It may be pointed out that he always refers to Pāṇini by this term.

2. Towards the end of Paspasā both Kātyāyana and Patañjali make it plain that the object of this Samāmnāya is to have the

Pratyāhāras which Pāṇini uses in writing his grammar; in other words, Pāṇini arranged the Varṇas in this order and added the Anubandhas to them in order to have Pratyāhāras. We have there the following :

Kātyāyana :	वृत्तिसमवायार्थ उपदेशः ।
Patañjali :	का पुनर्वृत्तिः । शास्त्रप्रवृत्तिः । समवायो वर्णानामनु- पूर्व्येण सन्निवेशः ।
Kātyāyana :	अनुबन्धकरणार्थश्च ।
Patañjali :	अनुबन्धकरणार्थश्च वर्णानामुपदेशः । अनुबन्धानासंक्षयामिति । वृत्तिसमवायश्चानुबन्धकरणं च प्रत्याहारार्थम् ॥

3. After a long and important prolegomenon, Patañjali introduces us to the texts of his commentary with the words :—

कथं पुनरिदं भगवतः पाणिनेराचार्यस्य लक्षणं प्रवृत्तम् ।

His commentary on the Akṣarasamāmnāya comes after this and should form part of the text.

4. From Bhartrhari also we know that this Samāmnāya or Sanniveśa (arrangement of the Varṇas in this particular order) was not current before Pāṇini's time. He rightly calls it Pāṇini's Svānupūrvī. Says he :

¹⁷न स्वेषां स्वरूपावधारणार्थ उपदेशः ।

किं तु स्वानुपूर्व्यर्थोऽनेनानुपूर्व्येण शास्त्रे किञ्चित्कुर्युरिति ॥

On each of the Sūtras of the Samāmnāya Kāśikā says :

इतं करोति प्रत्याहारार्थम् ।

A good deal of evidence of this kind can be adduced; but since the above is sufficient for our purpose, we may proceed to investigate the source of the legend which says that the Sūtras of the Akṣarasamāmnāya were vouchsafed to Pāṇini by Śiva at the end of the penance done by the former on Himalayas.

The Source of the Legend :—

In the beginning of his Kāśikā in which he gives a symbolic interpretation of the Sūtras of the Akṣarasamāmnāya Nandikeśvara says :

नृत्तावसाने नटराजराजो ननाद ढक्कां नवपञ्चवारम् ।
उद्धर्तुकामः सनकादिसिद्धानेतद्विमर्शे शिवसूत्रजालम् ॥

From the evidence adduced above we know that this legend is not known to Bhartrhari and is therefore of a much later invention. We have now to answer the question 'How did it arise?'

Its probable source :—

A careful study of the Kāśikā of Nandikeśvara and its commentary by Upamanyu in comparison with works on Kāśmir Śaivism reveals the fact that Nandikeśvara is indebted for this legend to the latter which record a similar one with regard to the origin of the Śiva Sūtras which laid the foundation of that school of philosophy. ¹⁸The Śiva Sūtras are said to have been revealed to Vasugupta by Śiva. In his Spandavṛtti Kallaṭa says :

लब्धं महादेवगिरौ महेशस्वप्नोपदिष्टाच्छिवसूत्रसिन्धोः ।
स्पन्दामृतं यद्वसुगुप्तपादैः श्रोकल्लटस्तत्प्रकटीचकार ॥

Mystic¹⁹ interpretation of the Varnas is a common feature of some Tantra works relating to this school of philosophy. Both Nandikeśvara and his commentator Upamanyu flourished in Kāśmir in the golden days of the Advaita Śaivism.

The following verse in the Kāśikā of Nandikeśvara clearly expounds the Śakti Tattva of that school :²⁰

अकारो ब्रह्मरूपः स्यान्निर्गुणः सर्ववस्तुषु ।
चित्कलामिं समाश्रित्य जगद्रूप उणोश्चरः ॥

18. See J. C. Chatterji, Kāśmir Śaivism, pp. 22ff. The different versions of this legend have been examined in this excellent work.

19. See the Mālinīvijayottara Tantra, Adhi. 3-4, etc.

20. Cf. the other verses also. See Chatterji, Ibid, pp. 63ff.

The commentator Abhimanyu is quite frank about it. He begins his work²¹ thus :

नमः शिवाय देवाय सर्वाय परमात्मने ।
यस्योन्मेषनिमेषाभ्यां व्यक्ताव्यक्तमिदं जगत् ॥
गुरुं शिवं कुमारं च शिवतत्त्वविशारदम् ।
प्रणम्य नन्दिकेशादीञ्छिवभक्तान्मुहुर्मुहुः ॥

And ends it thus :

हकारः शिववर्णः स्यादिति शैवागमस्थितिः । इति शिवम् ।

This commentary is named Vimarśinī. It is very interesting to note that Kṣemarāja's commentary on the Śiva Sūtras, too, has the same title.

²²The doctrine of the Logos, i.e. the Parāvāk is common to both the Vyākaraṇa philosophy and Kāśmir Śaivism.²³ But it is not our object to enter here into any comparison or to find out which one borrows it from the other. Suffice it to say that the source of the legend which makes the Samāmnāya a revelation is the one pointed out above.

How later Commentators tamper with texts :—

1. The Sūtras of the Akṣarasamāmnāya were originally called Pratyāhārasūtras. This original name is found in some old manuscripts²⁴ of the Aṣṭādhyāyī. The Vārtika²⁵

प्रत्याहारेऽनुबन्धानां कथमज्ग्रहणेषु न ।

21. Printed in the N. S. edition of the Mahābhāṣya (pp. 132ff).

22. See Chatterji, *ibid*, p. 6 (extract from the Tantrāloka); Kaul, Introduction to the Mālinīvijayottara Tantra, pp. 6ff.

23. But there is this important difference between the two. While Bhartrhari, the greatest exponent of the Sphoṭa philosophy recognizes only three states of Vāk, viz. Paśyantī, Madhyamā and Vaikharī, Parā being identical with Paśyantī to him, the Tantra school has four, Parā being accepted as distinct from Paśyantī. Upādhyāya was influenced by the latter. I shall deal with this subject in extenso elsewhere.

24. Adyar 9 D. 10; 9 D. 60. etc.

25. See the Mahābhāṣya on हयवरट्

refers to these by this name. Explaining this Vārtika the Śābdika-cintāmaṇi says :²⁶

प्रत्याहारोऽत्राक्षरसमाम्नाय इति हरदत्तः ।

But in such later works as the Siddhāntakaumudī, etc., we find at the end of the Samāmnāya the remark इति माहेश्वराणि सूत्राणि ।

2. The third verse of the Pāṇinīyaśikṣā originally read :

त्रिषष्टिश्च चतुःषष्टिर्वर्णाः संभवतो मताः ।

This reading is found in an old Ms. of the Adyar Library, bearing the shelf number 21. N. 4. But the reading that we now have as mostly current is वर्णाः संभुमते मताः । The former reading is usually relegated to footnotes by modern editors.

3. At the end of the Pratyāhārāhnika Bhartrhari says :²⁷

एवमस्य वाग्व्यवहारस्य न कश्चित्कर्तास्ति ।

Bhartrhari does not refer here to the Akṣarasamāmnāya ; but Nāgeśa quotes and interprets this as follows²⁸ :—

हरिणा अस्याक्षरसमाम्नायस्य वाग्व्यवहारजनकस्य न कश्चित्कर्तास्त्येवमेव वेदे पारम्पर्येण स्मर्यमाणमिति व्याख्यातम् ।

According to this interpretation, the Samāmnāya is not only a revelation to Pāṇini from Śiva, but also an eternal Śruti !

The legend recorded in the verse²⁹

यान्युज्जहार माहेशाद्व्यासो व्याकरणार्णवात् ।

तानि किं पदरत्नानि भान्ति पाणिनिगोष्पदे ॥

by Dhanarāja is too baseless and absurd to deserve any consideration.

26. Adyar Library Transcript, Vol. I, p. 220.

27. *Ibid.*, p. 111.

28. Udyota, Vol. I, p. 132 (Nirnayasagar, ed.).

29. Praṇavavāda of Gārgyayana, Bhagavan Das, pp. 78-79, Theosophical Publishing House.

III. The Rationale of the Akṣarasamāmnāya

The following analysis will also make it clear that Pāṇini arranges the Varnas into this Samāmnāya for the purpose of having the various Pratyāhāras on which he bases his work.

Up to ए Pāṇini follows the usual order of the vowels which is seen also in Prātiśākhya. He reads ओ after ए and औ after ऐ . Giving them in this order, Pāṇini is able to have the Pratyāhāras एङ् (P. 1.1.2, 1.1.75, 6.1.69, 6.1.94, 6.1.109) and ऐच् (P. 1.1.1, 7.3.3, 8.2.106) respectively. The Rk-Prātiśākhya also gives the latter in the same order. Compare अकारकारावि उ ए ओ ऐ औ³⁰ | Either one borrows from the other or both follow some ancient school of phonetics which reads them in this order. Uvvaṭa explains this Rk-Prātiśākhya as follows :³¹

अकारस्य इकारेण उकारेण एकारेण ओकारेण च सह सन्धौ यान्यक्षराणि निष्पद्यन्ते तानि तथोच्यन्ते ।

क् and लृ have to form a separate Sūtra because they cannot be included in एच् (P. 1.1.48 ; 6.1.45 ; 6.1.78 ; 8.2.107) or in अण् (P. 6.3.111; 7.4.13, etc.) . Cf.³²

पूर्वेणाणग्रहणाः सर्वे परेणेण ग्रहणा मताः ।
ऋतेऽणुदित्सवर्णस्येत्येतदेकं परेण तु ॥

But they have to be included in अक् (P. 6.1.101, 6.1.128) . Hence क् and लृ occupy this position.

Next comes ह् which has to be included in अट् (P. 8.4.2) . In order to maintain Yathāsamkhyā between इक् and यण् (P. 6.1.77 and 1.1.45) Pāṇini does not read it after य । The repetition of this letter at the end has the advantage of its inclusion in शल् (P. 3.1.45).

30. P. 13, Benares Sanskrit Series. By placing क् after अ this Prātiśākhya is perhaps attempting to give the original pronunciation of the vowel.

31. P. 20.

32. See the Mahābhāṣya, Vol. I, p. 130 (N. S. ed.).

Cf.³³

हकारो द्विरूपात्तोऽयमटि शल्यपि वाञ्छता ।
अर्हेणाधुक्षदित्यत्र द्वयं सिद्धं भविष्यति ॥

य, व, र and ल are read in the order of their corresponding vowels इ, उ, ऋ and लृ. The other two advantages which Pāṇini gains by giving the semi-vowels in this order are these : (1) य and व are not denoted by रल् (P. 1.2.26) ; (2) य is not denoted by वल् (P. 6.1.66 and 7.2.35).

ल has to stand separate from the other semi-vowels, since it cannot be included in अर्ल् (P. 8.4.2).

अण्, the Pratyāhāra formed by अ with the ण् of लण्, is used in P. 1.1.69.

As regards the nasals, i.e. ज, म, ङ, ण and न Pāṇini follows the order in which he has to give the respective Tṛtīyas and Caturthas.

Cf. क्षमन् । घढधष् । जबगडदश् ।

Why Pāṇini gives the latter (Tṛtīyas and Caturthas) in this order is explained below. ज, म, ङ, ण and न have to be placed here in order to be denoted by the Pratyāhāra यम् (P. 8.4.64).

Next come the Vargacaturthas. Only म, घ, ढ and ध have to be denoted by मष् (P. 8.2.37). Being placed before म, क्ष is thus excluded from मष् । By this arrangement Pāṇini gains another advantage also, namely the inclusion of क्ष along with the other Caturthas in the Pratyāhāra क्षष् (P. 8.2.37 and 40).

The semi-vowels, nasals क्ष and म have to be denoted by यन् (P. 7.3.101). Hence क्ष and म are given separately before other Caturthas. As between क्ष and म, क्ष deserves to be placed first, having regard to their established order which he follows also in the arrangement of the rest, namely घ, ढ and ध. From

33. See the Prasāda, Part I, p. 14, Bombay Sanskrit Series edition.

this it would be clear that he gives the Varṇas in the usual order wherever the exigencies of his grammar do not require their arrangement otherwise.

Next comes the Vargaṭṛtīyas which are excluded from झष् (P. 8.2.37 and 40) and ञष् (P. 8.2.37), but included in ह्रष् (P. 6.1.114) and अष् (P. 8.3.17). Paṇini gives the Ṭṛtīyas in the order in which he has given the Caturthas in the previous Sūtras.

Now he has to arrange the Dvītiyas. The first among these, namely, ख is mentioned first. क् which has to be excluded from क्व (P. 8.3.7) is given next. The rest are arranged in their usual order.

In order that the Prathamās may not be mixed up with the Dvītiyas, he does not read the Sūtra कपयू between जवगडदश् and खक्छठथचटत्. This position of क and प has also two other advantages, namely the denotation and non-denotation of these two by खर् (P. 8.3.15 and 8.4.55) and क्व (P. 8.3.7) respectively.

After the Vargyas we have ś, ṣ and s read in their usual order and at the right place. The purpose of the repetition of ह has been stated above.

A question may be asked as to whether Pāṇini has, while arranging the Varṇas as demanded by his Pratyāhāras, been able to maintain any phonological order? A further examination enables us to answer this question as follows:—

He gives the vowels except ओ and ऐ in their usual order. As regards ओ and ऐ we have already noted that the Ṛk-Prātiśākhya also gives these vowels in this order. We have also noted the phonological reasons given by Uvvaṭa for this. Perhaps the same reasons have weighed with Pāṇini also. In the arrangement of consonants Pāṇini is guided more by the Bāhyaprayatnas than by the Ābhyantaraprayatnas or Sthānas. Thus the consonants which he reads from ह to ढ are those which are produced by the Bāhyaprayatnas Saṁvāra, Nāda and Ghoṣa. From त to च are those produced by Vivāra, Śvāsa and Aghoṣa.

Cf.³⁴

खयां यमाः खयःकःपौ विसर्गः शर एव च ।
 एते श्वासानुप्रदाना अघोषाश्च विवृण्वते ॥
 कण्ठमन्ये तु घोषाः स्युः संवृता नादभागिनः ।

There is also another point to be noted. Pāṇini arranges the consonants according to their respective places in the Vargas. Instead of beginning with the Prathamas and going up to the Pañcamas, he begins with the Pañcamas and comes down to the Prathamas. Perhaps this is warranted by the various Pratyāhāras which he has adopted for his work. First he gives all the Vargapañcamas; then the Caturthas; then the Tṛtīyas; then the Dvītiyas; then the Prathamas. The Varṇas in the Pratyāhārasūtras are thus very thoughtfully arranged by Pāṇini. A better arrangement on which a work like the Aṣṭādhyāyī with its intricate system of Pratyāhāras could be based cannot be thought of.

That in spite of the demands of the various Pratyāhāras that are absolutely necessary for his work, Pāṇini has been able to give the Varṇas in the Pratyāhārasūtras in a certain order is really one of his greatest achievements.

IV. *Its and Pratyāhāras are Pāṇinyupajñas*

From our study on Its and the Akṣarasamāmnāya it follows that Pāṇini was the first grammarian to use Its and Pratyāhāras; for it has been pointed out above that both these devices depend on the Akṣarasamāmnāya of which Pāṇini is undoubtedly the author. Of course monosyllabic symbols are known to have been used by pre-Pāṇinian grammarians.

Cf. आङि चापः (P. 7.3.105).

Kāśikā : आङिति पूर्वाचार्यनिर्देशेन तृतीयैकवचनं गृह्यते ।

³⁵बहुलं ताणि (P. 2.4.54, V. 11).

Patañjali : किमिदं तणीति । संज्ञाछन्दसोर्ग्रहणम् ।

Praudhamanoramā (P. 6.4.84) षणीति पुल्लिङ्गस्य प्राचां संज्ञा ।

34. See the Siddhāntakamudī with the Tattvabodhinī, p. 5 (N. S. ed.).

35. See also Kātyāyana on P. 3.2.8. and 4.1.52.

But it must be noted that these symbols are used by them only as Saṃjñās and not either as Pratyāhāras or Its.

V. *The Dhātupāṭha.*

One important fact emerges from the foregoing, namely that Paṇini is also the author of the Dhātupāṭha. Most of the Dhātus in the Dhātupāṭha are arranged according to their Anubandhas.

Cf. कथन्ताः षट्त्रिंशदनुदात्तैः (S. Kamudī on P. 8.4.18).

The addition of the Anubandhas to the roots in the Dhātupāṭha has no other purpose than to bring in the operation of Pāṇinisūtras like

आदितश्च (7.2.16)

इदितो नुम्धातोः (7.1.58)

स्वरतिसतिसूर्यातिधूजूदितो वा (7.2.44)

पूषादिद्युताद्युदितः (3.1.55)

ह्यन्तक्षणश्चसजागृणिश्च्येदिताम् (7.2.5)

Thus it is reasonable that the author of the Dhātupāṭha should be identified with Pāṇini. Pāṇini's authorship of the Dhātupāṭha is made plain also by the Mahābhāṣya on P. 1.3.72. On this Sūtra Patañjali says :

तथाजातीयकाः स्वल्वाचार्येण स्वरितजितः पठिता य उभयवन्तो येषां कर्त्र-
भिप्रायं चाकर्त्रभिप्रायं च क्रियाफलमस्ति ।

Ācārya is a term which Patañjali always uses when referring to Pāṇini.

VI. *The Gaṇapāṭha*

That Pāṇini is also the author of the Gaṇapāṭha is apparent from the following Mahābhāṣya which finds solution for a difficulty which arises if Ākṛtipakṣa is accepted, namely, the denotation by a vowel of such incorrectly pronounced ones of its kind as Saṃvṛta, Kala, etc., in the reading of Gaṇasābdas which consist of vowels pronounced

correctly, that is to say, devoid of all Doṣas. If the Gaṇapāṭha is non-Pāṇinian, Patañjali would not resort to this explanation; for at the same place we see Patañjali fearing that the Śāstra would turn out non-Pāṇinian if Saṃvṛta, etc., are used instead of Anubandhas. It is thus evident that he thinks that the Gaṇapāṭha is also Pāṇinian. The Mahābhāṣya under reference is as follows :—

३६ आकृत्युपदेशात् सिद्धमिति चेत्संवृतादीनां प्रतिषेधो वक्तव्यः । के पुनः संवृतादयः । संवृतः कलो ध्मात् एणी कृतोऽम्बूकृतोऽर्धको ग्रस्तो निरस्तः प्रगीत उपगीतः क्षिपणो रोमश इति । अपर आह—

ग्रस्तं निरस्तमविलम्बितं निर्हतमम्बूकृतं ध्मातमथो विकम्पितम् ।

सन्दष्टमेणीकृतमर्धकं द्रुतं विकार्षमेताः स्वरदोषभावना इति ॥

अतोऽन्ये व्यञ्जनदोषाः । नैष दोषः । गर्गादिविदादिपाठात् संवृतादीनां निवृत्तिर्भविष्यति । अस्त्यन्यद्गर्गादिविदादिपाठे प्रयोजनम् । किम् । समुदायानां साधुत्वं यथा स्यादिति । एवं तर्ह्यष्टादशधा भिन्नां निवृत्तकलादिकामवर्णस्य प्रत्यापत्तिं वक्ष्यामि । सा तर्हि वक्तव्या ।

लिङ्गार्था तु प्रत्यापत्तिः ।

लिङ्गार्था सा तर्हि भविष्यति । तत्तर्हि वक्तव्यम् । यद्यप्येतदुच्यतेऽथवैतर्ह्यनेकमनुबन्धशतं नोच्चार्यमित्संज्ञा च न वक्तव्या । लोपश्च न वक्तव्यः । यदनुबन्धैः क्रियते तत्कलादिभिः करिष्यते । सिद्धयत्येवमपाणिनीयं तु भवति । यथान्यासमेवास्तु । ननु चोक्तमाकृत्युपदेशात्सिद्धमिति चेत्संवृतादीनां प्रतिषेध इति । परिहृतमेतद्गर्गादिविदादिपाठात्संवृतादीनां निवृत्तिर्भविष्यति ॥

VII. The *Phit Sūtra*, the *Lingānuśāsana* and the *Unādi Sūtra*

As regards such later works as the *Phitsūtra* and the *Lingānuśāsana*, no one has reasons to accept them as Pāṇini's works. I have dealt with the authorship of the *Unādisūtra* elsewhere (*Festschrift Prof. P. V. Kane*).

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36. See the concluding portion of *Paspaśā*, Vol. I, pp. 13-14, Kielhorn's ed.

VIII. ³⁷*The General Scheme of the Aṣṭādhyāyī*

Chapter I: Samjñās and Paribhāṣās; Anubandhas bearing on mutation of roots; Ekaśeśa; active and middle verbal terminations; Kāraka; Gatis and Karmapracanīyas.

Chapter II: Compounds; Upapada; Ādeśas of stems; Ādeśas of roots or heteroclitic conjugation; Luk with reference to composition, derivation, etc.

Chapter III: Derivative roots; formation of tense-stems; Kṛts; conjugational Vibhaktis.

Chapter IV—V: Strīpratyayas; Taddhitas; Samāsāntapratyayas.

Chapter VI—VII: Articulative-phonological and morphological processes; word-accent and compound-accent; processes in the Pūrvapada; vocalic changes.

Chapter VIII: Doubling of words; sentence-accent; Samhitā processes; consonantal changes.

IX. *Pāṇini's defects*

A study on Pāṇini would be incomplete if we do not notice here his three main defects.

1. Pāṇini's treatment of the Vedic language is not satisfactory; in no way does it help us to decide in what relation to his grammar does the Samhitā literature exactly stand. He leaves out of account a large number of Vedic words including those occurring in the Ṛk and Sāma Vedas. Probably his indifference to the Vedic language is deliberate, for (as I have shown in my paper 'Kātyāyana' which is in the course of publication in the Poona Orientalist) he writes his grammar only for the Bhāṣā and does not intend it to be a Vedāṅga text.

2. Though he is undoubtedly the greatest Sanskrit grammarian, Pāṇini, strangely enough, uses a few ungrammatical expressions. Patañjali gives the following instances.

तिर्यच्यपवर्गे (P. 3.4.63)

37. For a more detailed account of this see Barend Faddegon, *Studies on Pāṇini's Grammar*, pp. 49 sq.

Patañjali :

अयुक्तोऽयं निर्देशः । तिरश्चीति भवितव्यम् । सौत्रो निर्देशः ।
अन्वच्यानुलोम्ये (P. 3.4.64)

Patañjali :

अयुक्तोऽयं निर्देशः । अनूचीति भवितव्यम् । सौत्रोऽयं निर्देशः ।
प्रोक्ताल्लुक् (P. 4.2.64)

Patañjali :

अयुक्तोऽयं निर्देशः । प्रौक्तादिति भवितव्यम् । सौत्रो निर्देशः ।

In the Vyākaraṇādhikaraṇa³⁸ of the Tantravārtika Kumārila says :

सूत्रे तावत् जनिकर्तुः प्रकृतिः (1-4-30) इत्यत्र हि द्वावपशब्दौ । जनि-
शब्देन हि इक्श्चित्पौ धातुनिर्देश इत्यनेन लक्षणेनान्वितो धातुरेव निर्दिश्यते ।
न च तस्य कर्तुः प्रकृतेरपादानसंज्ञेष्यते । जायमानस्य पुनरर्थस्य जनिशब्दो वाचक-
तया नैव लक्षणेनानुगतः । तेनायं दरिद्र इवाश्वशब्दो जनिमात्रवाचित्वात् तदर्थं
प्रत्यसाधुरेव विज्ञायते । तथा तृजकाभ्यां कर्तरि (2-2-15) इति प्रतिषिद्धषष्ठीसमास-
प्रयोगाद्व्याकरणफलपरित्यागः । एवं तत्प्रयोजक (1-7-55) इति प्रतिषिद्ध एव
समासः ॥

3. Pāṇini's main intention in adopting such various devices as Its, Pratyāhāras, etc., is to secure economy in expression. We have also the Paribhāṣā

अर्धमात्रालाघवं पुत्रोत्सवं मन्यन्ते वैयाकरणाः ।

But the Mahābhāṣya on the following Sūtras says that in their case he has not been able to adhere to this maxim ; according to Patañjali, each of these is either partly or wholly superfluous. Here is one instance.

मुखनासिकावचनोऽनुनासिकः । (P. 1.1.8)

38. Adhikaraṇa, 1.3.8.

Patañjali :

मुखग्रहणं शक्यमकर्तुम् । केनेदानीमुभयवचनानां भविष्यति । प्रासादवासि-
न्यायेन । तद्यथा केचित्प्रासादवासिनः । केचिद्भूमिवासिनः । केचिदुभयवासिनः । ये
प्रासादवासिनो गृह्यन्ते ते प्रासादवासिग्रहणेन भूमिवासिग्रहणेन च । एवमिहापि
केचिन्मुखवचनाः । केचिन्नासिकावचनाः । केचिदुभयवचनाः । तत्र ये मुखवचना गृह्यन्ते
ते मुखग्रहणेन । तत्र ये नासिकावचना गृह्यन्ते ते नासिकाग्रहणेन । य उभयवचना
गृह्यन्त एव ते मुखग्रहणेन नासिकाग्रहणेन च ॥

See also the Mahābhāṣya on—

P. 1.1.23; 1.1.25; 1.1.44; 1.1.48; 1.1.50; 1.2.45; 1.2.59-60; 1.2.69;
1.2.73; 1.3.72; 1.4.108; 2.1.13; 2.3.30; 2.3.46; 3.1.58; 3.1.71;
3.1.93 3.3.119; 3.4.32; 4.1.22; 4.2.11; 4.2.59 (see 4.2.67-70);
4.2.62; 4.2.96; 4.4.23; 5.1.3; 5.1.16; 5.4.70; 5.4.73; 6.1.2; 6.1.18;
6.1.39; 6.1.70; 6.1.72; 6.4.45; 6.4.127-128; 7.1.10; 7.1.11; 7.1.56;
7.1.62; 7.2.89; 7.2.90; 7.3.31; 7.3.70; 8.1.74; 8.2.6; 8.2.38;
8.2.40; 8.2.46.

It must, however, be noted that in most instances this defect appears to us only when we judge the Aṣṭādhyāyī in accordance with the rules of interpretation laid down by Patañjali. It may not appear in so many cases if Pāṇini is studied independently of Patañjali.

Occasional digressions:—Introduction of a foreign matter into a different context has been mentioned by some scholars as one of Pāṇini's defects. "39He wanders in an intricate maze, and the key of the labyrinth is continually slipping from his hand" says Colebrooke. 40Wackernagel also cannot "see anything in Pāṇini save the dim light of a rational plan and the deep night of historical chance, miserliness in words, love of ease, a breaking down of natural connections, the whole a whirlpool of caprice." But Faddegon points out that all digressions are associative digressions and that they cannot thus be said to be one of Pāṇini's defects. Under the caption "Main principles of Pāṇini's forms of literary composition" this learned scholar says :

39. See Herebert H. Gowen, A History of Indian Literature, p. 151; Vide also Vaidya, History of Sanskrit Literature, section III, p. 122; Macdonell, A Sanskrit Grammar for beginners, Introduction, p. 9.

40. Altindische Grammatik, p. 62.

“The associative digression, which often interferes with the logic of division, can be either due to what precedes or to what follows, or it arises from the wish to link together two logically divided subjects. Sometimes, moreover, a section is not limited to the subject expected by the reader according to the context, but at the same time deals with subjects which in the author’s mind are coherent with it.

As an example of preceding digression may be mentioned sū. 2.1.2. for whilst adhy. 2 pā. 1 and 2 treat in general of the compound, the sūtra mentioned gives the rule that a noun-case dependent on a following vocative is considered with reference to accent to be as it were one word with this vocative.

As an example of following digression may be quoted 8.4.57, where unexpectedly a rule is given for final vowel in a context dealing with final consonants, mainly because of the anuvṛtti of vāvasāne which thus could be used.

The instances of concatenative digression are very numerous; see for instance passage 4.1.77-81, which forms part both of the section on denominative noun-derivation.

As an example of too wide discussion may be quoted 1, 3, 2-9, for, whilst the introductory sū. 1, 3, 1 dhātavaḥ and the total discussion of 1,3,12-fin, show that the main subject of the pāda is the verb and its active and middle voice, yet the sūtras 2-9 do not only give rules for the anubandhas of the Dhātupāṭha, but treat the anubandhas in general.”

THE SPERMATOGENESIS OF CHILOSCYLLIUM GRISEUM
(MÜLLER & HENLE).

By

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(COMMUNICATED BY PROF. R. GOPALA AIYAR)

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INTRODUCTION

On reviewing the prevalent literature on Elasmobranch fishes, it is observed that no work has yet been done on the spermatogenesis of any of the forms so common in our Indian seas. A few of the French workers have contributed to the study of Elasmobranch sex cells, among the foremost of whom may be mentioned Ant de Martino (1846, 1848), Lallemand (1841), Sabatier (1882, 1895, 1896), Stephan (1902, 1903) and others. The German scientists, among whom may be mentioned Ballowitz (1890), Hermann, F (1897, 1898), Hermann, G. (1882), Rawitz (1899), Retzius (1902, 1909), Suzuki (1899) and others have greatly added to our knowledge of spermatogenesis in Elasmobranchs. Much work has also been done by such English scientists as Moore (1895) and others. There seems to be a void in the literature of this subject when we begin to realise that allied forms existing in our Indian waters have been so profoundly neglected and this has been one of the main reasons for my taking up this subject for investigation.

MATERIAL AND TECHNIQUE

The genus *Chiloscyllium* includes four species of which the species *griseum* occurs largely on the Madras Coast. It is characterized by its greyish brown colour with transverse bands of white spots. This colouration however varies with age, the bands disappearing in older specimens. Though the species occurs in large numbers on the Madras Coast, collections made periodically between the months of October 1938 and December 1939 showed only three specimens out of the forty obtained, to be sexually mature.

Due to the immense numbers of forms obtainable of the species, I proposed to make a thorough study of the nuclear and cytoplasmic contents of the different generations of germ cells occurring in the spermatogenetic cycle of the Elasmobranch. Considerable difficulty has been previously experienced by numerous workers regarding the study of the chromosomes of Elasmobranch fishes, as the chromosomes of these forms always exhibit the tendency to a close approximation with each other on fixation by any of the ordinary known fixatives. I must admit that the chromosomes of *Chiloscyllium griseum* did give me much trouble in the

initial stages of my attempts, and though repeated attempts were made at procuring good preparations of the nuclear contents of the sex cells, it seemed at first that they were destined to be futile. All the various nuclear fixatives such as Corrosive-sublimate-acetic, Carnoy, 50% Formic, Schaudin, Bouin and its modification by Ezra Allen, Rabl's picro-sublimate and the like were commonly employed for the fixation of the nuclear elements. Ultimately Sansom's modification of Carnoy proved to be the most suitable for the study of the chromosomes. The addition of 2% Urea to Bouin was seen to give very sharp pictures of the chromosomes and incidentally it aided in the minute study of the distinctive stages undergone by the chromatin in its course through the spermatogenetic cycle. Ezra Allen's Chromic-bouin and Urea was also found to be remarkably helpful in the study of the chromosomes as also in the study of the centrosome. The centrosome was mainly studied under the action of Flemming with acetic and this afforded very good results.

Examination of the cytoplasmic components mainly depended upon preparations made after fixation in the following fluids:—Zenker without acetic, Regaud, Champy, Flemming without acetic, Schridde, MannKopsch, Ludford, Nassanow and Da Fano. Mitochondria was easily detected after fixation in the above fluids, especially in Schridde's, and Golgi bodies were particularly prominent in preparations made by the methods of MannKopsch, Ludford, Nassanow and Da Fano. Immersion in turpentine, after the osmication methods, showed the distinction between the Golgi apparatus on the one hand and mitochondria on the other, for the blackening from the former was extracted less rapidly than from the latter by turpentine. Fat was studied under the action of formaline while fresh material soaked in saturated solution of Sudan III in alcohol for eighteen hours distinctly depicted its presence between the cysts.

Paraffin method of embedding was employed in all cases and sections were cut ranging from three to ten microns in thickness. The thinner sections were found to be more useful for the study of the cytoplasmic elements while for an accurate counting of the chromosomes, Agar's method of mounting thicker sections between two coverslips was employed with success.

Iron haematoxylin was exclusively used after all nuclear fixatives, eosin being sometimes used as a counterstain. Very rarely sections were stained in Delafield's and Ehrlich's haematoxylin and

Mann's methyl-blue-eosin. For the detection of mitochondria Altmann's acid-fuchsin was employed as the stain after fixation in MannKopsch, in which case the mitochondria appeared red while the Golgi remained black.

Smears proved very helpful for the study of mature sperms as sections hardly ever revealed isolated sperms distinctly, the sperms, by the time they attained maturity, being found clumped together in bundles and attached to sertoli cells bordering the testis tubules.

Intra-vitam staining was attempted to check the results obtained after treatment with the above-mentioned fixatives and found to be extremely helpful.

STRUCTURE OF THE TESTIS

The testes of forty individuals were examined and it was observed that the fish reached a minimum length of 45 cm. before it attained sexual maturity. It was therefore not possible for me to study the different stages of development of the sex cells by examining any one fish only, but a careful and systematic study of the testes of individuals of all sizes had to be made. To outward appearance the testes are in the form of two compact, elongated bodies, narrow at the anterior end and broader posteriorly, situated at the hinder end of the abdominal cavity and attached to the dorsal body wall by the mesorchia, while they are free ventrally. In the youngest form examined, which measured 27 cm. in length and 4 cm. in width, the gonads present a very undeveloped condition. In a transverse section of the same it is observed that the germinal epithelium (Ph. M. 1) consists of a row of cubical cells which are tightly packed against each other. Under this epithelium there is a very thin layer of fibrous tissue which, in older specimens, occupies a broad region at the periphery. This fibrous tissue encloses a dense mass of cells within, and it is in this region that the different generations of sex cells are later differentiated. These centrally located cells are evidently derived from the germinal epithelium and may be distinguished into two types, one in which the cells are small and polymorphically nucleated and the other in which they are comparatively large and spherically nucleated. The germinal epithelium frequently presents stages of amitotic division and this fact suggests that the germinal epithelial cells probably multiply by this method of division. Besides this

activity on the part of the germinal epithelium it exhibits constant modification of certain of its cells into particularly large cells which get transported wholly into the central region of the testis so that clear empty spaces are visible in certain regions of the germinal epithelium in between the existing cells (Ph. M. 1). In addition to this a certain number of cells produced as a result of amitosis in the germinal epithelium migrates towards the centre before passing through the preliminary stage of enlargement like those that have been just described. The passage of these two kinds of cells, the large and the small, towards the central region of the testis has been clearly observed (Ph. M. 1) and it is only reasonable to suppose that this passage of cells from the periphery of the gonad to its interior through the fibrous layer involves a change of shape in the nuclei so that by the time the cells reach the interior their nuclei have become polymorphic in appearance. When they are within this central region they present various shapes, some being lobed, crescentic, reniform or U-shaped, others spindle-shaped and still others elongated in form. In fact there is a marked polymorphism in the nuclei of the cells present in the immature gonad. There now ensues a gradual differentiation of these variously shaped cells so that we now come to a stage where, as a result of transformation we get the initial generation of sex cells constituted. This takes place in two different ways. Some of the cells that did not undergo a precocious enlargement prior to the migration through the fibrous layer now enlarge and their nuclei become spherical and thus convert themselves into primary spermatogonia, while a great majority remain small, retain their polymorphic nuclei and give rise to a set of cells which is destined to perform totally diverse functions within the testis. Many of them get transformed into follicle and interstitial cells while others contribute to the formation of the cells of sertoli all of which subserve a mechanical function. While this is so, those cells that had migrated to the interior only after previous enlargement within the germinal epithelium, now get directly converted into primary spermatogonia. When we examine the testis at this stage a wide range of difference is seen to exist between the frequency of occurrence of those cells with polymorphic nuclei and those with spherical nuclei, the former being found to largely preponderate over the latter. The chromatic nature of the nuclei of these cells varies according to whether they are irregular or spherical, the former consistently staining much darker with chromatic dyes than the latter. The polymorphic nuclei usually

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present within themselves large blocks of chromatin (Fig. 1), while the more spherical nuclei present a distinct nucleolus in the centre with strands of chromatin at their periphery (Fig. 2). When we consider the size of these two different types of cells—that with polymorphic nuclei and that with rounded nuclei—we observe that there is always a marked difference between the two, the former being always very much smaller than the latter. The testes of very young forms examined showed the very great preponderance in numbers of those cells with polymorphic nuclei over those with spherical nuclei though it was observed that a minor portion at least of the less frequently occurring spherically nucleated cells are the later transformation products of the existing numerous polymorphically nucleated cells, this transformation proceeding very slowly.

In this connection I may briefly mention the formation of cysts or follicles in the testis of *Chiloscyllium*. Soon after the differentiation of the two types of cells in the testis some of the polymorphically nucleated cells destined to become follicle cells approach a fully developed spherically nucleated cell, become spindle-shaped or elongated, and ultimately surround it enveloping the cell in a clear circular space (Ph. M. 2). This is the initial stage of formation of cysts in the young gonad, and these, as growth advances, develop into the large cysts to be described later. The spherically nucleated cell, as it lies perfectly protected within the encasement of follicle cells, is nurtured and nourished by the latter so that when it has reached its maximum growth begins to divide and give rise to fresh cells. Meanwhile an interesting phenomenon may be observed in certain cysts. Some of the follicle cells of certain cysts, originally intended to serve a protective and nutrient function, become active, grow profusely, attain a spherical form and ultimately slip into the lumen of the cyst and there develop further. These cells enclosed within the follicle cells are the earliest generations of primary spermatogonia.

In an older testis due to the increase of cells within, the germinal epithelium gets stretched to such an extent that the component cells which in a younger testis were cubical in shape now appear elongated. Beneath this germinal epithelium the fibrous layer with its elongated, spindle-shaped nuclei so characteristic of connective tissue cells, lies. With the formation of cysts within the testis, the cells which originally filled the testis and did not take any share in the formation of the

cysts, get shifted to the periphery and occupy the region just below the fibrous layer. Both the fibrous layer and the layer of cells below it together constitute the stroma of the testis. The cells of the stroma exhibit the presence of two kinds of inclusions one of which is spherical while the other is elongated (Ph. M. 3). They occupy the cytoplasm of the cells, the latter type of inclusion usually crowding together at one pole of the nucleus, while the former appears scattered. Both the forms never occur together in the same cell. These inclusions disappear before the cells lose their indifferent nature and take on the character of special types of cells. They also occur in cells of very young testes where differentiation into cysts has not yet commenced as well as in the germinal epithelium, and make their appearance even in material fixed with such strong nuclear fixatives as Carnoy, Bouin and Corrosive-sublimate-acetic. I am unable to decide on the exact nature of these inclusions.

The stroma occupies a broad peripheral region of the testis while it is fairly young, but as it grows older some of its cells stream into the interior of the testis and contribute to the formation of new cysts; some of the cells transform themselves into sex cells while others elongate, their nuclei becoming spindle-shaped and contribute to the formation of follicle cells which surround the sex cells and form a complete envelope to them, while still others transform themselves into fairly large interstitial cells which remain outside and between the cysts. Cells of the fibrous layer also stream in with the above mentioned cells and form a thin layer around individual cysts. The streaming in of the stromal cells takes place from the postero-ventral border of the testis (Ph. M. 4) and it is in this region that most of the younger cysts are found, while at the antero-dorsal border the cysts are always found to be mature. A regular displacement of cysts from the postero-ventral region in the antero-dorsal direction takes place continuously as the cysts get mature and in this process the cysts undergo a rotating motion with the result that the tails of sperms present within the cysts exhibit a spiral arrangement among themselves. By the time the mature cysts have arrived at the antero-dorsal end of the testis the sperms are fully mature and now a collapse of the cysts takes place and the sperms are carried to the adjoining ducts present in this region. With the collapse of the cysts the follicle cells and the supporting or sertoli cells aggregate together and form a conspicuous tissue

of large cells in this region (Ph. M. 5). This is especially abundant in old testes. With the streaming in of the stromal cells from the postero-ventral border and the consequent thinning out of the stroma in this region, the cells forming the tissue in the antero-dorsal region of the testis replace this loss by transforming themselves into stromal cells and then shifting down to the postero-ventral border of the testis. They thus return to the function of serving as follicle or sertoli cells once again, and though the possibility of their functioning also as germ cells suggests itself I cannot at present give direct evidence to prove that such a process does take place.

On examining a fresh testis which is fairly developed, the individual cysts may easily be separated by means of a needle. The mature cysts may be readily distinguished from the immature ones, as the former are white in appearance while the latter are yellow, the intermediate ones grading from yellow to white. The occurrence of fat in the intervening spaces among the cysts along with groups of interstitial cells may here be mentioned. When sections of interstitial cells are examined, fat in the form of droplets is seen in the cytoplasm and it therefore stands to reason that the fat present in between the cysts in the testis, is formed as a secretion of the interstitial cells of the testis. The presence of blood vessels in the testis may also be mentioned, a greater number of them traversing the region of the stroma which therefore is very well vascularised (Ph. M. 4).

THE PRIMARY SPERMATOGONIA

I have thus far described the occurrence of two kinds of cells in the immature gonad, one with polymorphic nuclei and the other with spherical nuclei, and have also shown the former as being partly the source of the latter. Those with polymorphic nuclei I describe as indifferent cells some of which later, as a result of transformation, give rise to primary spermatogonia while others give rise to various other kinds of cells. The spherically nucleated cells, as already described, develop into primary spermatogonia by a gradual enlargement in their dimensions and the development of the coarse reticulum so characteristic of primary spermatogonia.

The primary spermatogonia (Fig 3) on account of their large size and weakly-staining character stand out in distinct contrast to the surrounding elements. The nucleus is almost always excen-

trically placed. The nuclear membrane in all cases is distinct and takes the plasma stains deeply. Within the nucleus is present a distinct nucleolus situated more towards the periphery than the centre, it being held in place by a number of chromatin threads which cross each other at irregular intervals. These threads are made up of a number of deeply-staining chromatin granules embedded in linin, the whole threadwork lying in a thin sap within the nucleus. The nucleolus is of the nature of a plasmosome. The centrosome is a single, small, homogeneous structure, unlike what has been described by Moore (1895) in other Elasmobranchs where the presence of a double centrosome or diplosome has been depicted and its position within the cell is constant being invariably situated close to the nuclear membrane. The centrosome is represented only by a centriole, the astral rays in this case being indistinct. The action of different fixatives does not seem to affect the appearance of the centrosome though Champy (1913) seems to emphasize the fact that the variety of form presented by the centrosome is the result of the action of different kinds of fixatives, mentioning that the astral rays are unreal making their appearance only on the employment of such fixatives as Flemming or Bouin and so on and disappearing in material fixed in Benda or trichloroacetic-formol etc. While I can neither corroborate nor contradict his statement, I should wish to say that these radiations or astral rays have never been observed to be present in any of my preparations, however varied the fixatives employed have been.

In *Chiloscyllium*, the mitochondria in the initial stages lie in the form of a crescentic cap closely apposed to the nuclear membrane at one of the poles of the nucleus (Fig. 4). This mitochondrial cap presents a finely granular appearance and conceals the granular centrosome within its interior. As development proceeds the cap disintegrates with the result that a gradual extension of the elements to all parts of the cytoplasm occurs (Figs. 5 & 6). A fairly uniform distribution of mitochondria is therefore established in a well developed primary spermatogonial cell and thereby the chances of an approximate distribution of these elements to the daughter cells during the ensuing process of division, well ensured. The mitochondria are well preserved in Schridde's fluid as also in Zenker's without acetic and Regaud's, and take a deep stain with iron-alum-haematoxylin.

The Golgi elements consist of deeply stained rings or crescents lying in close proximity with the mitochondrial cap and almost

completely investing it. As the cell progresses in growth the Golgi bodies gradually desert the vicinity of the mitochondrial cap and migrate out into the clearer cytoplasmic area presenting a scattered appearance (Figs. 7 & 8). This scattered condition of the Golgi bodies is very common and marks the later stages of spermatogonial activity.

Oguma and Kakino (1932) in their "Revised check-list of chromosome numbers in vertebrata," have recorded the numbers only in a very few Elasmobranchs. It was my intention therefore to study the number and nature of the chromosomes in *Chiloscyllium griseum*, and thereby add to the existing knowledge of chromosomes in the group. The chromosomes of *Chiloscyllium*, as in other Elasmobranchs do not lend themselves to easy observation, when prepared by the ordinary methods of fixation. As mentioned already in a previous section, all the ordinary fixatives were tried for the fixation of chromosomes but the best fitted for use were found to be Bouin's fluid with the addition of Urea, Corrosive-sublimate-acetic and Sansom's modification of Carnoy, the last being found to be exceedingly useful for chromosome counts. The earlier stages of chromosomes however were better studied under the action of Bouin and Corrosive-sublimate-acetic.

With the assumption of the spherical form by the polymorphic nucleus of the indifferent cell, the irregular blocks of chromatin present within its interior transform themselves into elongated threads, one or more blocks contributing to the formation of each thread. At this stage the presence of a nucleolus is unobserved within the nucleus of any of these cells (Fig. 9), but with their encasement within the follicle cells the chromatin threads become much finer and there appears to view a distinct, deeply-staining, large nucleolus (Fig. 10). This nucleolus however soon fragments and disappears and the nucleus is now observed to be crowded with a number of granules arranged along a thin linin reticulum. Condensation of this structure takes place immediately after and with the segmentation of the same the chromosomes are constituted (Fig. 11). Concomitant with these changes the centrosome divides and the products of division separating from one another quickly travel to the two opposite poles of the nucleus.

As soon as this cytoplasmic condition has been established the cell plunges into the metaphase stage (Fig. 12). This phase wherein the chromosomes assume the form of short bent rods and lie

on the equatorial plane of the spindle is a very transitory one for I have experienced great difficulty in tracing such stages in my preparations, though the closely following anaphase stage (Fig. 13) occurs in fair abundance as also the telophase (Fig. 14). The chromosomes, very extraordinarily, preserve their distinct identity in the late anaphase stage, but due to the crowding of the same at the two poles it was impossible for me to determine their exact number, though I can say with certainty that my chromosome counts vary between the numbers twenty four and twenty six. Within the telophase the chromosomes are still more or less distinct, though at the close of this stage, they fuse to form a chromosomal ring in each daughter nucleus (Fig. 15). Very soon the daughter nuclei are constituted. The Golgi bodies which in the prophase of division were observed to exist as scattered rings and crescents, occur in the anaphase stage at the two poles of the spindle while the mitochondrial granules, lacking this polar orientation, surround the spindle in the form of a loose mantle (Fig. 16). Within the telophase they are distributed almost equally to the two daughter cells.

THE SECONDARY SPERMATOGONIA.

These cells are smaller than the primary spermatogonia and their nuclei are always rounded or oval. The nucleus consists of large blocks of chromatin connected by coarse threads all of which stain deeply. Within the cytoplasm are observed the single, granular centrosome, crescentic and ring-like Golgi bodies, and granular mitochondria, the Golgi bodies loosely investing the centrosome while the granular mitochondria lie evenly distributed in the cytoplasm (Figs. 17 & 18). With the onset of the prophase, the spireme takes its origin from the large chromatic blocks already described, a process similar to what occurred in the primary spermatogonia, and synchronous with these changes the granular centrosome which so far was observed to occupy one of the poles of the cell, divides into two, and the products of division travelling apart from each other constitute a fine spindle between them. The immediate formation of the chromosome is now observed and the cell enters into the metaphase of division. The chromosomes at this stage are not very distinct though in the succeeding anaphase they are observed to be arranged in the form of a ring not unlike those present on the anaphase spindles of the primary spermatogonia, except for the fact, that, in this case, the chromosomes are

considerably smaller in size and more crowded together. This ring-like arrangement of the chromosomes is clearly evident in cross sections of the anaphase stages, the central spindle fibres here also, as in the primary spermatogonial spindles, being of the nature of mantle fibres only. With the close of the telophase stage the daughter nuclei are constituted.

As these nuclear changes are in progress the Golgi bodies which in the initial stages were concentrated at the centrosomal pole get dispersed throughout the cell, and the mitochondria which, however, from the earliest stages of their existence in the secondary spermatogonial cells, did not show this concentration so characteristic of the Golgi elements, and occurred uniformly distributed throughout the cell, with the initiation of the anaphase stage get approximately distributed to the resulting daughter cells in division. These division products of the secondary spermatogonial cell give rise to the next generation of germ cells—the primary spermatocytes.

THE PRIMARY SPERMATOCYTE.

Before the growth of the primary spermatocyte is initiated the cell undergoes a period of rest, during which the chromatin within the nucleus appears in the form of a very coarse network. At this stage the cells are arranged along the walls of the cyst in rows of two or three forming a compact mass, but when the nuclear changes are initiated a re-arrangement of the cells takes place with the result that a space originates in the centre of the cyst (Ph. M. 6). The metamorphosis of this resting nucleus into the active condition is marked by the dissolution of the chromatin blocks with the consequent evolution of a fine reticulum which holds within its meshes a distinct large nucleolus. Soon however, a secondary nucleolus makes its appearance, and the presence of two distinct nucleoli is observed to be very characteristic of spermatocytes at this stage of development (Fig. 19 & Ph. M. 7). The centrosome is very distinct at this stage. In a short time the chromatic threadwork gets coarser and thicker, at the same time exhibiting a tendency to contract towards one side of the nucleus, leaving a clear space at the opposite side (Fig. 20). This space is perfectly clear except for a few linen filaments which extend across it, and this contraction of the nuclear contents to one side seems to be characteristic of this particular stage of spermatocytic growth.

With the first indication of approaching mitosis the dense reticulum gradually resolves into a number of principal threads, and

this condition of the nucleus gradually merges into the leptotene stage in which all the chromatic material takes the form of very long thin threads which build a complicated pattern within the nucleus (Fig. 21). The secondary nucleolus has made its disappearance meanwhile. The disappearance of the secondary nucleolus at this stage of the primary spermatocyte prophase, is a phenomenon which, so far as I am aware, is not recorded in other Elasmobranchs. Moore (1895) records the persistent occurrence of both the primary and secondary nucleoli throughout both the generations of the secondary spermatogenetic period, in his account of "The structural changes in the reproductive cells during the spermatogenesis of Elasmobranchs." In *Chiloscyllium* however, the presence of the secondary nucleolus from this stage onwards is unknown; only the primary nucleolus persists through the stage, until in a slightly later stage it also makes its complete disappearance. The leptotene threads soon become arranged in a parallel manner and thereby merge into the zygotene stage, wherein a gradual side-by-side fusion between pairs of leptotene threads is effected (Fig. 22). At times the nucleus of the zygotene stage shows the free ends of the conjugating pairs of leptotene filaments, embedded in the primary nucleolus (Fig. 22). In such cases the fusion is clearly observed to commence from the nucleolar ends of the zygotene pairs and proceed towards the free outer ends of the same. The result of this parallel fusion of the leptotene threads in the zygotene stage is the production of the pachytene threads (Fig. 23 & Ph. M. 8). These pachytene threads are much thicker than the leptotene threads evidently due to their bivalent character and are remarkable in that they present a moniliform appearance. This particular stage of prophase is of much longer duration than the rest, for whole cysts of cells may be very frequently observed to be in this condition of activity. Another characteristic of this stage is the complete loss of orientation of the threads, which so far have been observed to lie directed towards the nucleolus situated on the periphery of the nuclear wall. This haphazard disposition of the pachytene threads is, therefore, evidently due to the sudden disappearance of the nucleolus, the function of which is obviously to initiate the side-by-side fusion of the leptotene threads, and also to serve as a starting point wherefrom this parallel fusion of the leptotene threads could conveniently commence. Immediately following the pachytene stage is the diplotene stage in which the temporary conjugation between the components of the pachytene threads is severed except at their extreme ends

(Fig. 24). The parallel threads thus reformed next undergo a process of very pronounced synizesis, the threads getting clumped together at one side of the nucleus (Ph. M. 9). Due to this onset of synizesis the diplotene stage does not present very clear pictures of its activity. It appears that the separation of the conjugants along their lengths takes place so very quickly that the pachytene threads are as though abruptly transformed into elongated rings. These rings assume a peripheral position for a long period of time leaving the centre of the nuclear space empty. This condition of a peripheral distribution of the chromosomes prior to the dissolution of the nuclear wall, is a phenomenon which occurs widely in spermatogenesis. A remarkable change now occurs and the chromatic loops undergo great contraction along with which the formation of the spindle is observed.

The cytoplasmic elements of the primary spermatocyte may now be considered before a study of the later stages of division is made. The Golgi bodies in the primary spermatocyte occur as a crescentic mass closely applied to the nuclear wall (Fig. 25 & Ph. M. 10) while the mitochondria appear as fairly large granules scattered all over in the cytoplasm, and showing a greater concentration in the region of the Golgi mass (Fig. 25). The centrosome also lies in close proximity with this region.

With the onset of metaphasic activity, the Golgi bodies spread haphazardly over the whole of the cytoplasmic area as do the mitochondria, though the accumulation of the Golgi bodies in the vicinity of the mitotic poles very soon becomes broadly apparent. With the onset of the anaphase and the completion of the succeeding telophase the two cytoplasmic constituents are approximately distributed to the two daughter cells (Fig. 26).

The metaphase stage of the primary spermatocyte is, like that of the spermatogonium, a very transitory one, though occasionally such a stage wherein the tetrads lie on the equatorial plane may be discovered. However, the chromosomes at this stage lie too crowded together to afford easy observation of their form and number. The onset of anaphase heralds the division of the tetrads into their component dyads which are thirteen in number, and as these dyads pass to the two poles they are observed, in cross section, to lie at the periphery of the spindle, the central region of the spindle being free from chromosomes. We thus get a ringlike arrangement of chromosomes in the early anaphase of the primary spermatocyte as well (Fig. 27 & Ph. M. 11). Within the telophase

the chromosomes get massed together, and with a vacuolation of this chromatic mass the formation of the daughter cell commences.

THE SECONDARY SPERMATOCYTE

The secondary spermatocytes are arranged within the cysts so as to present an appearance such as is shown in Ph. M. 12. The cells lie within the cavity of the cyst arranged closely together in 5 or 6 tiers towards the periphery, so that a distinct circular space is left within the interior of the cyst.

The nucleus of the secondary spermatocyte is characterized by a coarse network and from this network is constituted a number of separate filaments which show a peripheral distribution within the nucleus. With the formation of the chromosomes the nuclear membrane disappears, following which the spindle is constituted. As in the metaphase stages of the previous generations, the chromosomes are not distinguishable in the corresponding stage of the secondary spermatocyte. During the early anaphase however, when the dyads are separating into their constituent monads the number of chromosomes may be distinguished as 13 and again the ringlike arrangement of the chromosomes may be observed (Ph. M. 13). Soon after the telophase the contents fuse, before a branching of the same takes place to give rise to the network characteristic of the early spermatid.

The distribution of the cytoplasmic constituents follows the same course as that in the primary spermatocytes, the Golgi and the mitochondria getting distributed to the two daughter nuclei in almost equal amounts (Fig. 28).

THE SPERMATID

With the close of the telophasic activity of the secondary spermatocyte, the spermatid is constituted. It has an almost spherical nucleus with a chromatic network within, and enclosing a minute, faintly-staining nucleolus. At one pole of the spermatid may be observed the centrosome (Fig. 29).

The Golgi elements occur as a darkly-staining mass closely apposed to the nuclear wall though the individual bodies may occasionally be clearly distinguished, while the granular mitochondria occur loosely scattered in the cytoplasm. Whole cysts of spermatids at this stage of development may be seen on a cursory examination of a fairly ripe testis, situated more towards the antero-dorsal region of the testis. The occurrence of large num-

bers of cysts of such spermatids leads me to believe that a fairly long period of time elapses before the transformation of the spermatid into the spermatozoon commences.

THE TRANSFORMATION OF THE SPERMATID INTO THE SPERMATOZOON

With the initiation of the period of transformation of the spermatid into the spermatozoon, the chromatin network observed within the nucleus of the spermatid disintegrates and ultimately forms a number of large and small masses of chromatin, which arrange themselves in a most irregular fashion. They however, soon fuse with each other giving the nucleus a homogeneous, deeply-staining appearance. The nuclear wall at this stage is not distinct but in the ensuing one it becomes very prominent for a marked contraction of the nuclear contents takes place at this time. However, the contraction does not take place uniformly, for at that pole of the spermatid which is destined to become the anterior end of the sperm, the chromatin remains in connection with the nuclear wall and shows a lesser affinity for the stain while the rest of the chromatin exhibits a deeply-staining character. The chromatin within the nucleus soon assumes the shape of a flask, the mouth of which abuts against the nuclear membrane, while the sides of the neck are occupied by two great empty spaces or vacuoles (Fig. 30 & Ph. M. 14).

By this time the centrosome which was originally placed near the Golgi mass at one pole of the spermatid gradually travels round the nucleus and finally stations itself close against that portion of the nuclear wall which is destined to become its posterior end. This position of the centrosome is very distinct in preparations made after nuclear fixatives like Bouin and Corrosive-sublimite-acetic and stained by Iron haematoxylin. Immediately after this stage a very peculiar phenomenon occurs—the phenomenon of the cataclysmic disruption of the centrosome, entailing the abnormal formation of the axial filament in between the two products of centrosomal division. In this process the single centrosome observed at the posterior end of the spermatid nucleus abruptly fragments into two halves of which one—that destined to become the distal centrosome of the adult sperm travels so rapidly from the other and with such blinding force that when it meets the cell wall after its outward passage through the cytoplasm, bursts through the boundary and passes beyond, being however still connected

with its distinctive cell by means of the axial filament that has meanwhile been formed in an equally rapid manner and exists stretched in between the two centrosomal products, these products being henceforth designated as the proximal and distal centrosomes. This sudden bursting forth as it were of the axial filament from the centrosome, and the existence of the distal centrosome outside the boundary of the spermatid, strung to it however by means of the slender axial filament, are very unique in their character; in fact appear momentous when we consider the incipient formation of flagella in the spermatocytes of such Elasmobranchs as *Scyllium*, *Pristiurus*, *Torpedo* and *Raja* studied by Moore in 1895. Such incipient formation of flagella has not been observed in *Chiloscyllium*, though the precocious and extraordinarily hurried development of the axial filament in the spermatid approximates to a certain degree the condition described in the spermatocytes of the Elasmobranchs studied by Moore (1895). The distal centrosome in its rapid transport through the cytoplasm of the spermatid transforms itself quickly into a funnel-shaped structure, so that with the abrupt formation of the axial filament we also observe the simultaneous development of the funnel-like structure of the distal centrosome (Ph. M. 15). This phenomenal disruption of the centrosome and the consequent evolution of the axial filament, though a remarkable process, is of so momentary a nature that it was impossible for me to trace the intermediate stages of migration of the distal centrosome through the cytoplasm and beyond it. The earliest stage that I could distinguish in this process of tail-formation on the part of the spermatid, is shown in Fig. 30 and Ph. M. 15.

During the differentiation of the above mentioned structures the nucleus, which in its initial stages of transformation had moulded its chromatin within into the form of a flask, changes its shape and becomes pyriform, its narrower region destined to become the anterior end of the spermatid (Fig. 31 & Ph. M. 16). A little later it becomes pistol-shaped (Fig. 32) and with still further elongation assumes the shape of an elongated f. Further changes in the shape of the nucleus will be described later.

While the above nuclear changes are in progress the Golgi bodies of the spermatid fuse together in such a manner that an almost homogeneous mass of Golgi substance is obtained which may now be designated as the acroblast. This structure always occupies that pole of the spermatid which is destined to become the anterior end of the sperm and is diametrically opposed to that

region of the cell where the centrosome has settled down. The acroblast very soon elaborates within its substance a single small vesicle, which however, soon enlarges and becomes prominent (Fig. 33 & Ph. M. 17). When it reaches its maximum dimensions it is gradually pushed out of the acroblast and deposited close against the nuclear wall, the acroblast still maintaining its connection with the vesicle for a longer or shorter time. Soon it is filled with a dense substance so that the transparent appearance of the vesicle is lost, and when this change of appearance is effected the acroblast which up to now has been observed clinging to the wall of the vesicle like a lump, gradually separates itself and proceeds in a posterior direction to be later expelled from the substance of the spermatid. The vesicle together with the dense substance that it encloses comes to be known as the acrosome. This structure presently assumes a conical appearance (Figs. 34 & 35) and persists through the later stages of sperm formation as a thin short apical filament (Fig. 36), until in the metamorphosed spermatozoon it presents the appearance of a spirally twisted filament as depicted in Fig. 37.

Thus far the shallow, funnel-shaped distal centrosome has remained inactive, but with the elongation of the transforming spermatid the border of the funnel gets thickened until it presents the appearance of a ring (Fig. 35). I do not believe that this thickened rim of the funnel ever gets separated from the axial filament, but I do believe that it only persists as a thickened border while the axial filament proper continues its growth backwards and contributes towards the formation of the tail (Fig. 35).

A general flowing of the cytoplasm towards the posterior pole of the cell meanwhile occurs, and with this process the spermatid completes the formation of the middle piece towards which the mitochondria very largely contribute. The mitochondria which exist in the form of small granules scattered within the cytoplasm, travel towards the hinder end of the nucleus and there arrange themselves at the sides of the axial filament forming a sort of sheath. When these mitochondrial granules have attained this position they fuse with each other in such a manner that this region of the sperm presents a homogeneous appearance (Fig. 35). This region of the sperm with the axial filament enveloped by the mitochondrial sheath limited at its either ends by the proximal and distal centrosomes, and surrounded by a very delicate protoplasmic sheath, is designated as the middle piece of the sperm.

As these changes are in progress the nucleus is in a continuous stage of elongation during which process it assumes very curious shapes, the nuclear wall getting progressively separated from the chromatin within until finally it forms a sort of loose jacket on the outside.

Concomitant with the elongation of the nucleus and close upon the development of the middle piece and the formation of the ring-like border to the distal centrosome, the tail of the spermatozoon begins to be moulded. The cytoplasm, as has already been mentioned, having begun its retreat from the anterior pole of the cell travels towards the posterior limit, and on its way encloses a part of the axial filament that projects beyond the middle piece forming a sort of mantle. This region of the sperm consisting of the axial filament with only the enveloping cytoplasmic mantle constitutes the main piece of the adult spermatozoon (Fig. 36), while the naked distal part of the axial filament becomes its end piece.

The nucleus elongates considerably, the anterior portion being thin and tapering while the posterior region is comparatively thick, and stains a deeper blue with haematoxylin. The proximal centrosome at this stage, and possibly a little earlier, loses its distinct identity probably due to its very close apposition to the posterior end of the nucleus. The chromatin within the nucleus soon stains a homogeneous colour and directly after, the nucleus presents a wave-like appearance (Fig. 36).

During the earlier stages of transformation of the spermatids they were arranged in a most haphazard manner, but with the elongation of their nuclei they exhibit a tendency to be placed with their anterior extremities directed towards the cyst wall. However, with the assumption of the wave-like form by the elongated nuclei they get directed towards the periphery of the cysts, and also show a tendency to clump together in groups (Ph. M. 18). With the assumption of the wave-like form by the nuclei the spermatids may be said to have reached the culmination of their period of transformation, and we may now safely designate them mature sperms. By this time the cysts have enlarged considerably the basement layer of the cysts being reduced to a very fine limiting membrane lined here and there by comparatively large cells which may be called the sertoli cells. The nuclei of these sertoli cells are relatively poor in chromatin, and usually possess a single large nucleolus which stains intensely. These sertoli cells, at this stage of sperm development, become extra-

ordinarily prominent and project inwardly into the cyst, so that clumps of sperms presently get affixed to these cells by their anterior ends. The wave-like appearance of the nuclear heads soon changes to a spiral, the immediate result of which is the deeper penetration of the sperm heads into the protoplasm of the sertoli cell. The middle piece and acrosome also exhibit this feature of spiral winding (Fig. 37), and in this observation I agree with Hermann (1897) who describes a spiral winding of the middle piece and disagree with Rawitz (1899) who asserts that this appearance of the middle piece, as described by Hermann, is a mere optical illusion. That the object of the spiral winding of the nuclear heads is to effect the deeper penetration of the sperms into the supporting cells is obvious, and as such I do not see why the middle piece and the acrosome which are just as, if not more, important parts of the sperm as the nuclear head, should not contribute towards bringing this object into effect.

The clumps of sperms attached to the sertoli cells soon get compacted to form barrel-shaped structures, and with this the identity of each individual sperm is lost. At this time or a little later the sudden appearance of very curious, elongated, homogeneous bodies is observed (Ph. M. 18). On a cursory examination they are seen to lie at the sides of the sperm bundles more closely approximated to the sides of the nuclear heads. Careful observation however reveals the fact that these bodies escape from within the space enclosed by the nuclear regions of the maturing sperms making their exit by pushing their way through the interspaces of the nuclear heads. From their appearance they occur to me to be the remains of cell substance enclosed between the nuclear heads which while getting compacted into bundles mould this substance within into the elongated body that I have mentioned and ultimately extrudes it to the region between the sperm bundles. The occurrence of these elongated, homogeneous bodies has been mentioned by Rawitz (1899) in his description of the germ cells of *Scyllium* but he does not explain either its origin or significance.

With the extrusion of this strange body there is observed a curious bulging out of those regions of the sperm bundles which are occupied by the anterior portions of the middle pieces, though I cannot account for this strange appearance of the sperm bundles (Ph. M. 18). The bundles of sperms get further compacted and now they are in a condition preparatory to the process of expulsion from the cyst. The attachment of the

sertoli cells at this time get loosened and they migrate to one side of the respective sperm bundles which now sink into the cavity of the cyst thereafter to be conveyed to the exterior. With the collapse of the cysts and the passage of their contents to the exterior the cyst walls with their contained sertoli cells disintegrate and form a loose spongy tissue of large cells at the antero-dorsal region of the testis. This tissue is very prominent in a ripe testis and its elements later contribute to the formation of other cells which subserve a mechanical function within the testis.

Chiloscyllium reaches a minimum length of 40—45 cm. before it attains this mature condition.

DISCUSSION.

The axial filament and the centrosome :

The behaviour of the centrosome in the spermatid and its later division into the proximal and distal centrosomes together with the mode of formation of the axial filament have been described in many animals by various authors. In *Chiloscyllium* I have observed the very peculiar formation of the axial filament from the centrosome as a sudden bursting forth of the latter from the former, as a consequence of the sudden fragmentation of the original single centrosome into the proximal and distal ones, the former remaining granular in structure while the latter immediately attains a funnel-shaped appearance. This phenomenon occurs very abruptly.

In this connection I may mention the view of such a distinguished author as Hermann (1897) who believes that the mid body (Zwischenkorper) of the spindle of the secondary spermatocyte gives rise to the ring of the spermatid, a view which Benda (1893) advanced four years previously. Hermann (1897) also asserts that the axial filaments represent coalesced spindle fibres of the last division, thus explaining its fibrillar structure as already described by Ballowitz (1890). Though Hermann's observations have been greatly criticized by later authors such as Meves (1899) and Mac Gregor (1899) my observations on the spermatid cells of *Chiloscyllium* induce me to suspect that there is a certain amount of truth in Hermann's statements. That in every cell, the centrosome in the initial stages of division fragments into two and ultimately occupies the two polar ends of the spindle is certain; so is it also certain that these centrosomes are directly or indirectly responsible for the equal distribution of chromosomes as also the

Golgi and mitochondrial elements to the two daughter cells, the contractility of the spindle fibres being believed to be partly responsible for this equal distribution of nuclear and cytoplasmic elements. The activity of the centrosomes together with the formation and character of the spindle fibres drawn in between them are hence the principal factors that influence the distribution of both the nuclear and cytoplasmic elements of the cells. This mode of division and distribution of the cell components we observe from the early generation of primary spermatogonia down to the formation of the spermatid within which we ultimately find that all the original components—the centrosome, Golgi and mitochondrial elements are represented. It is this ultimate cell—the spermatid—that transforms itself into the mature sperm, and in this transformation we meet with a series of processes all working concomitantly towards the formation of the mature sperm, within which we observe what each nuclear and cytoplasmic unit has contributed towards its formation.

Taking the Golgi elements to begin with we observe that the acrosome is developed in relation with it, after the formation of which the Golgi remnant is expelled from the cytoplasm of the spermatid. As for the mitochondria, they contribute towards the formation of the middle piece of the sperm, coming to occupy the immediate vicinity of the axial filament and finally forming a sort of sheath to it, the filament itself being of centrosomatic origin and forming the axis of the middle piece and tail of the mature spermatozoon. The nucleus as we all know, gives rise to the head of the sperm.

We thus observe that the cell components—the Golgi, mitochondria and centrosome—all travel through the different generations of germ cells and ultimately, when they do reach the spermatid, give origin to special sets of structures which contribute towards the formation of the mature sperm. By the time the nucleus, Golgi and mitochondria have arrived at the spermatid stage they have almost expended all their potential energy so that within the spermatid they only perform the function of elaborating their ultimate products which finally collaborate in the building up of the mature sperm. In the centrosome however, we find a slight deviation. This structure, after it has attained its position in the spermatid has been observed to divide into the proximal and distal centrosomes in almost all animal spermatids, the one or the other or the division products of either giving rise to the axial

filament. In *Chiloscyllium* I have observed that the centrosome, when it has attained that position in the spermatid where it lies at the posterior extremity of the nucleus, is very clearly single for a considerable time during which the contraction of the nuclear chromatin takes place and finally assumes a flask-shaped appearance. At this stage however, when we should expect a gradual division of the centrosome into the proximal and distal ones entailing the growth of the axial filament from either of the two products, we here encounter a very curious phenomenon wherein a sudden fragmentation of the centrosome and the rapid bursting apart of its products is observed as also the concurrent formation of the axial filament which here exists stretched in between the two centrosomal products. This happens so abruptly and with such blinding force that the distal centrosome tears its course through the cytoplasm and finally bursts through the cell wall, though in this process, rapid as it is, a transformation of the distal centrosome into a funnel-shaped structure evidently seems to have occurred. And now, when we consider this division of the centrosome and the simultaneous rapid development of the axial filament in between its two division products, does it not remind us of the process of spindle formation so commonly met with in all the earlier generations of germ cells, though in this latter process the difference only lies in that all the activities proceed so slowly that we are in a better position to trace the course of division of the centrosomes and the formation of the spindle closely? The observations of Hermann (1897) come home to us when we reflect on this process of formation of the axial filament in the transforming spermatid, though certain minor differences may suggest themselves. That the spindle is indirectly if not directly responsible for the distribution of both the nuclear and cytoplasmic elements to the daughter cells is perfectly known, and if we should liken this sudden formation of the axial filament in the spermatid to the process of spindle formation in earlier generations of cells we should be able to say in what way this distribution of cell components is effected in the spermatid as well. The elements of the cell, as I have already said, have by the time they have passed through the spermatid stage, exhausted almost all their potential energy, so that within the transforming spermatid we see a culmination of the various processes with the striking result that almost every cell component has contributed in some way or the other towards the formation of the developing sperm. The nucleus hence gives rise to the head, the Golgi elaborates the acrosome,

the centrosome gives rise to the axial filament, and the mitochondria to the sheath of the middle piece. In fact considering every element within the spermatid cell we observe that all of them contribute in some way or the other towards the building up of the mature sperm. This ultimate product of spermatogenesis—the sperm—is however, intended to perform its own vital function in the process of fertilization—a process in the accomplishment of which every part of the sperm contributes its particular share. The acrosome functions in its own distinctive manner, so also the nucleus. It is in considering the centrosomal elements that we come to the problem of distribution of cell elements, for here we observe that immediately after the disruption of the original single centrosome and the formation of the axial filament the mitochondrial granules travel down to the posterior end of the cell and there arrange themselves at the sides of the axial filament to form a sheath, a process very similar to which we have followed in the earlier divisions of germ cells. Within the metaphase and anaphase stages of both the spermatogonial and spermatocytic divisions, we find that the mitochondrial elements form a sort of mantle surrounding the spindle; and now when we consider the arrangement of the mitochondrial elements around the axial filament in the spermatid, would we be far from right if we should liken this appearance to the metaphase stages of the earlier generations, and assume that this attenuated spindle within the sperm is intended only to effect a distribution of the mitochondrial elements within the cytoplasm of the egg and that it indicates a stage fore-running a division that is to soon follow? The nuclear and Golgi elements, having attained their ultimate objects in constructing the head and its attached apical body or acrosome, withdraw from the sphere of this attenuated spindle whereas the mitochondria depending for its distribution in the cytoplasm of the egg on the attenuated spindle (axial filament) of the sperm arrange themselves around it in the form of a mantle restricted at either ends by the proximal and distal centrosomes, the latter on account of its distinctive shape serving as a definite plug at the distal end of the middle piece and thereby limiting the mitochondrial extent within the sperm. It therefore becomes obvious that the centrosomes and the axial filament of the sperm are greatly modified in structure primarily to subserve the purpose of distribution of the mitochondrial elements in the egg cytoplasm during the process of fertilization, and that these modifications are perhaps only preliminary approaches to the succeeding stage wherein with the divi-

sion of the attenuated spindle the distribution of the mitochondria is effectively accomplished. In reconsidering Hermann's statement that the axial filament is formed by the coalescence and elongation of the spindle fibres of the last division, we may perceive that there is some truth in his interpretations though my observations differ from those of Hermann (1897) in that they tend to make me believe that the axial filament is formed not by the coalescence of the spindle fibres of the previous division but by the formation of an extraordinarily elongated spindle newly built within the spermatid. Probably this activity of the centrosome and the consequent formation of the axial filament in the spermatid represent only an incipient stage of division which arrives at its maturity only in the process of fertilization wherein the process is completed. The natural result of this completion of division in the initial stages of the process of fertilization would be the distribution of the mitochondria in the cytoplasm of the egg. According to Wilson (1928), in many animals "almost immediately after its entrance the sperm head rotates through an angle of 180° , so that the middle piece or basal region of the nucleus is directed inwards; and at the same time, or a little later, a single sperm aster appears in the region of the middle piece or actually centering in it". Would not this description of the formation of a sperm aster in the egg tally with the assumption that I have made that it is during the early stages of fertilization that the process of division already initiated in the sperm is completed, the consequent results being the transformation of one of the centrosomes of the spindle into the sperm aster and the disintegration and disappearance of the other, along with the distribution of the mitochondria enveloping the attenuated spindle (axial filament) of the spermatid into the cytoplasm of the egg? The explanation of Ballowitz (1889) regarding the fibrillar nature of the axial filament probably also justifies my assumption that the centrosomes and axial filament of the sperm form the incipient but attenuated spindle of a forthcoming division, though I must leave it to a later date to prove the validity of the statement that I have here advanced.

SUMMARY.

1. The structure of the testis and the origin of the polymorphically nucleated and spherically nucleated cells are described.
2. The primary spermatogonia, their nuclear and cytoplasmic elements and the behaviour of these elements during mitosis are all dealt with. Golgi bodies are described to occur as rings and

crescents and mitochondria as minute granules in the cytoplasm. The centrosome is distinct. All the activities of the secondary spermatogonia are also described.

3. The nuclear and cytoplasmic activities of the primary spermatocyte are discussed in full detail. The reduced number of chromosomes is 13. The distribution of the cytoplasmic elements and the activities of the centrosome during the prophase, metaphase and anaphase stages are traced through the generation. The secondary spermatocytes are also dealt with in full detail.

4. The spermatids and their transformation into the mature sperms are described. The nucleus constitutes the head at the anterior end of which the acrosome elaborated by the Golgi is attached, the mitochondria contribute to the formation of the middle piece while the centrosomes display a striking phenomenon wherein the axial filament is formed the major portion of which contributes to the formation of the tail of the spermatozoon.

5. The phenomenal formation of the axial filament consequent upon the fragmentation of the centrosome into its proximal and distal parts as also the significance of the axial filament and centrosomes are discussed.

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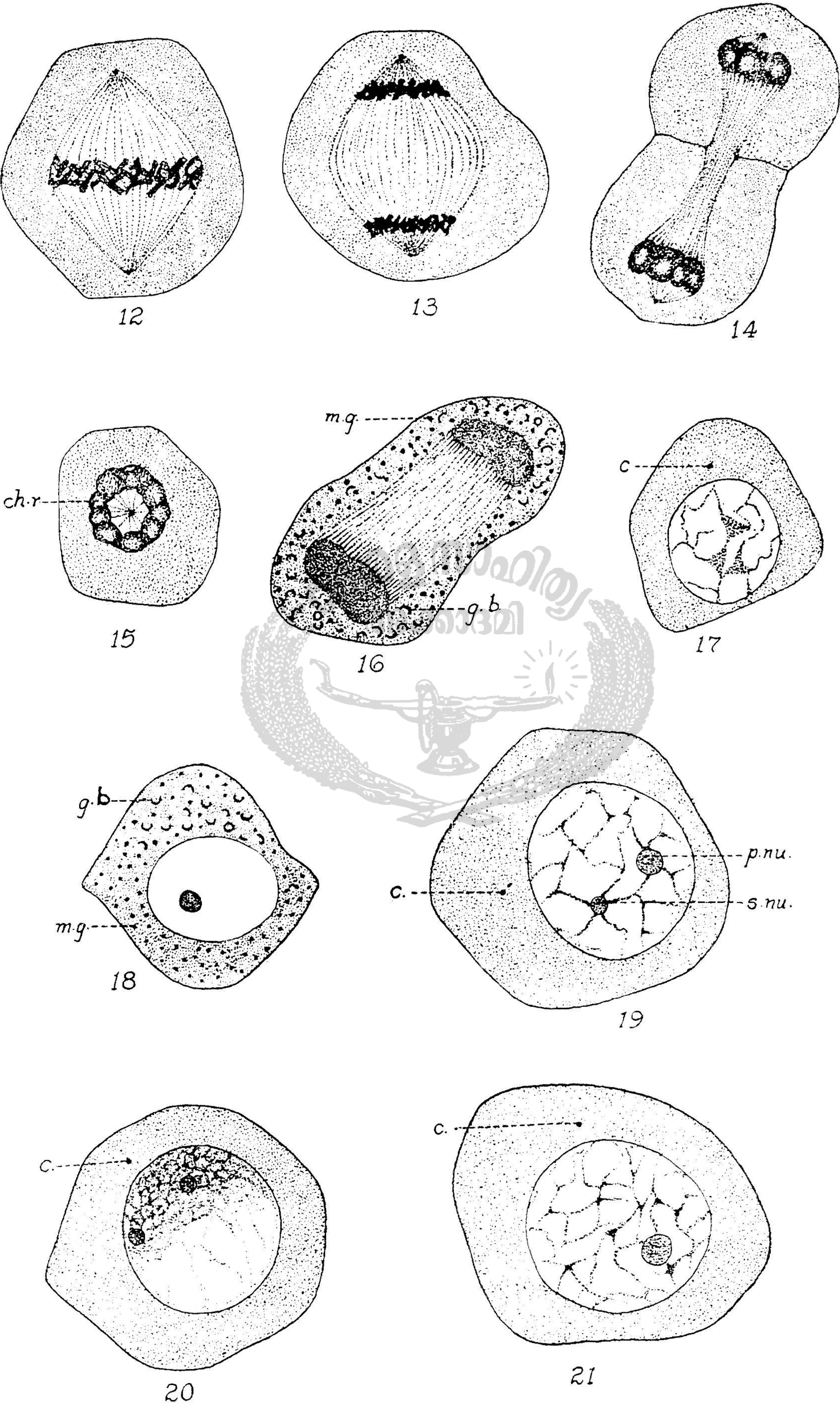
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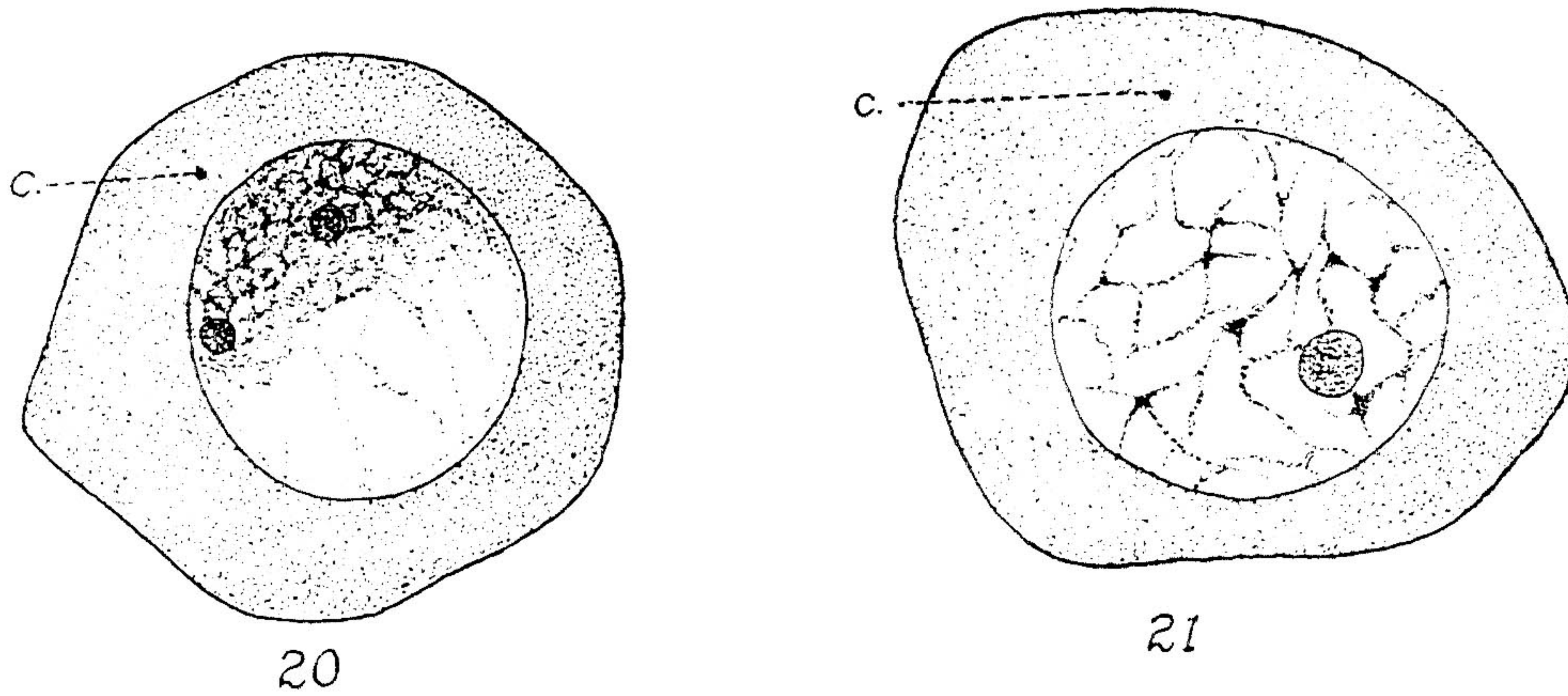
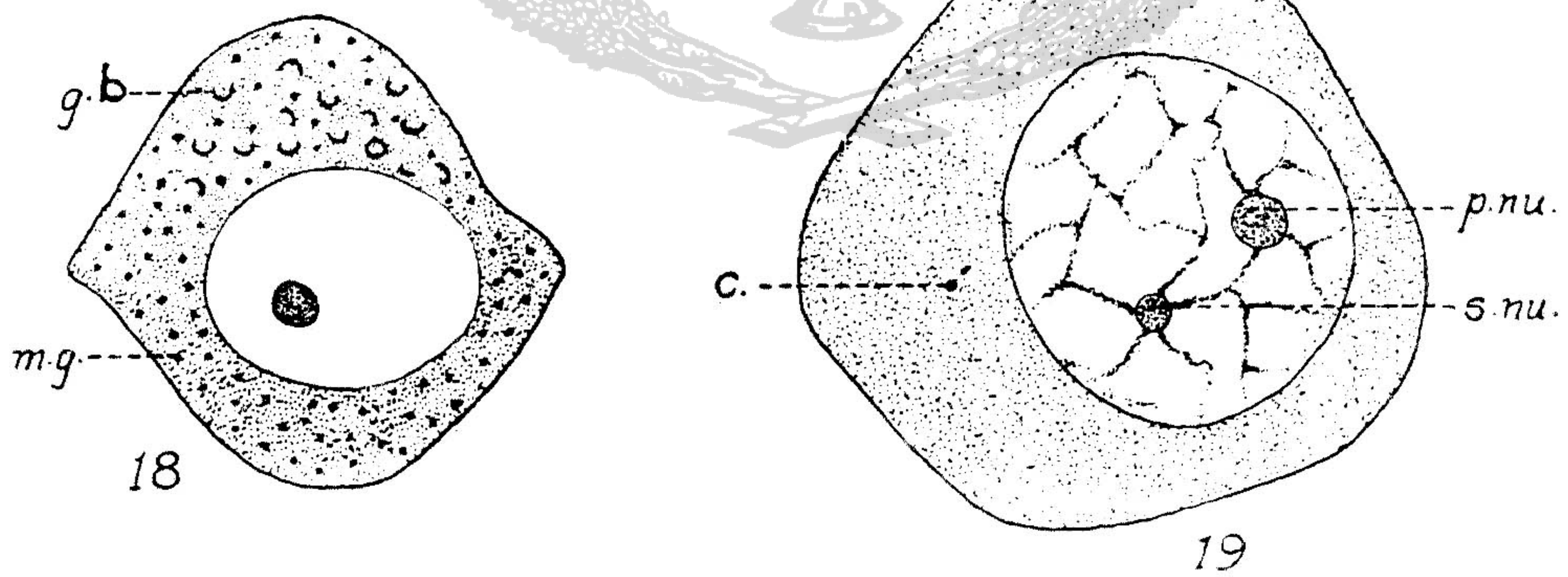
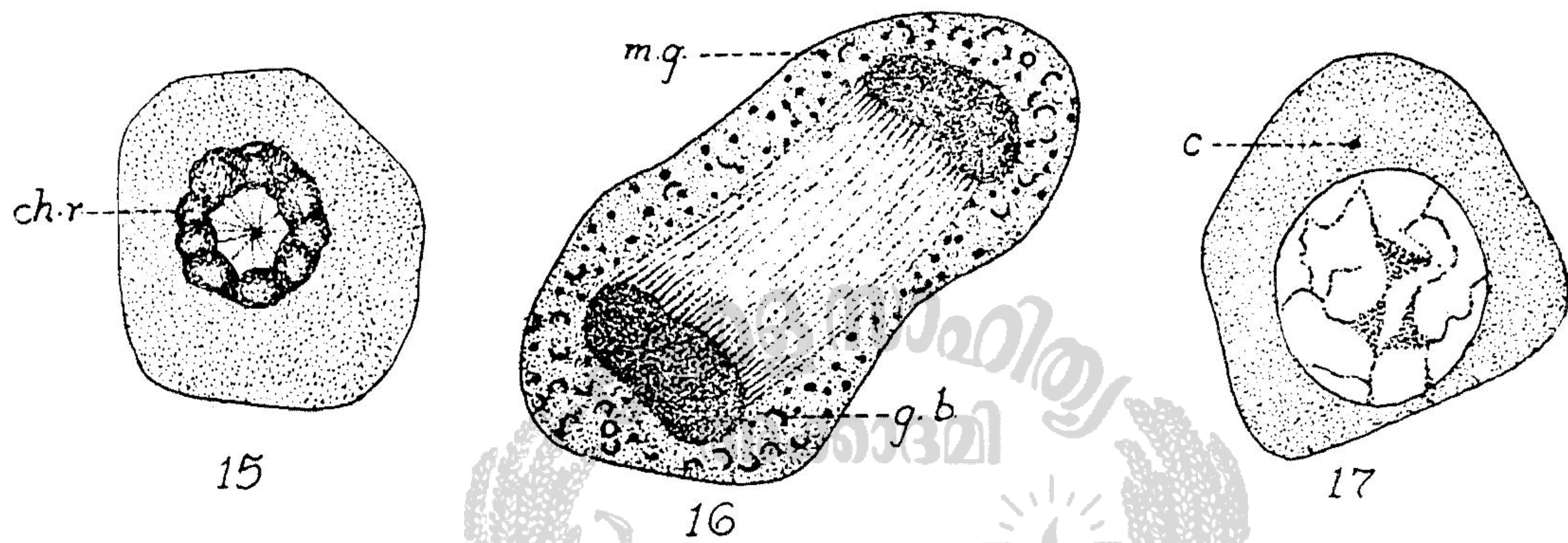
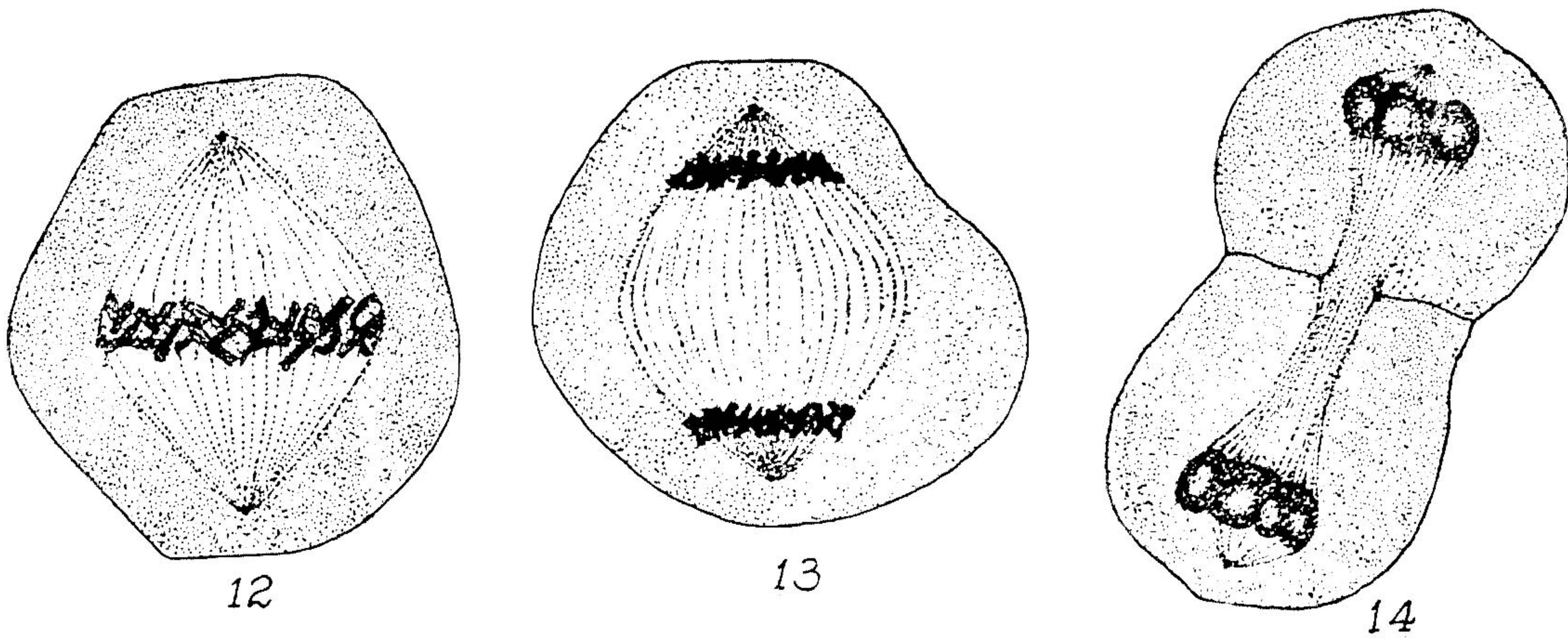
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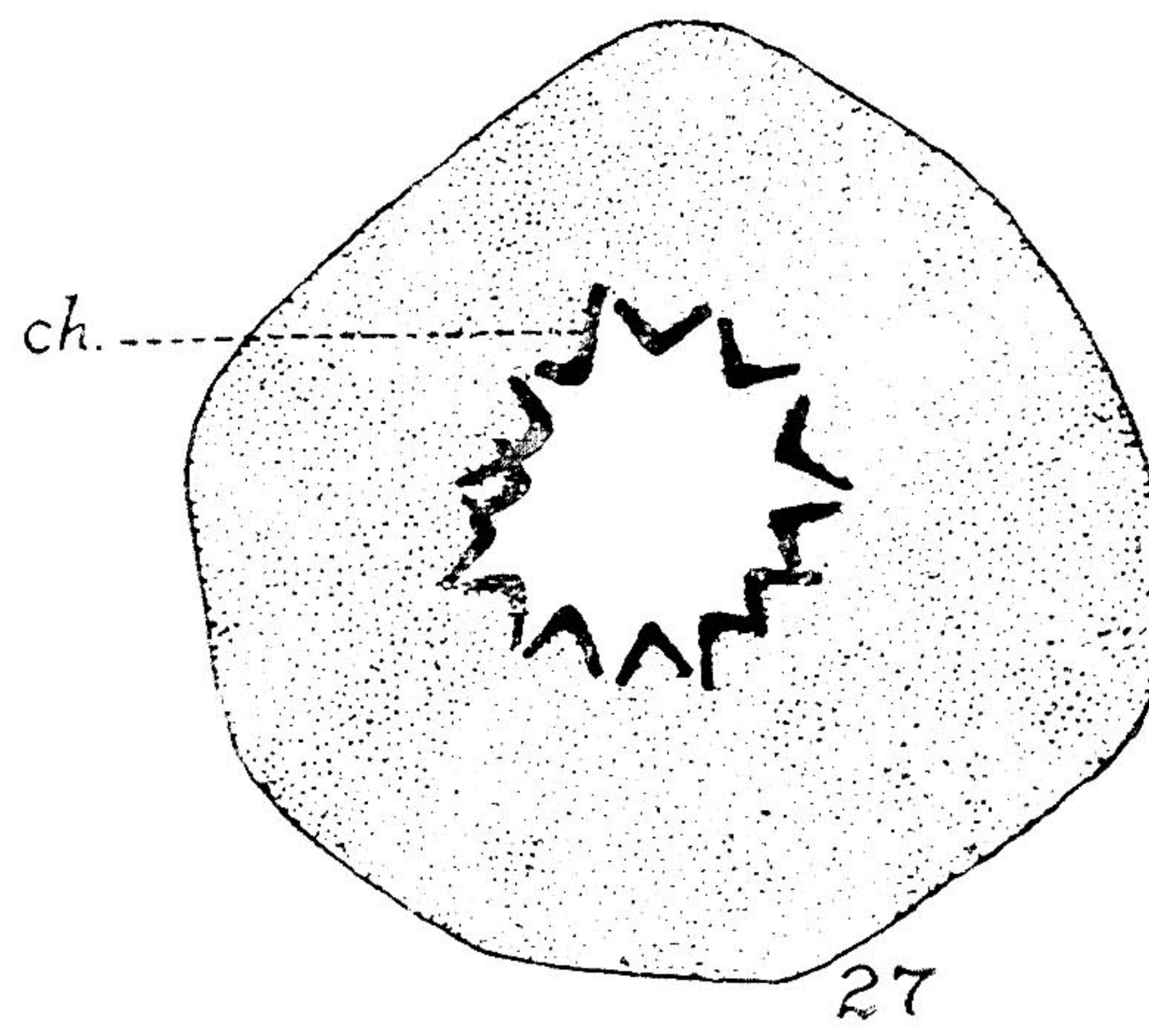
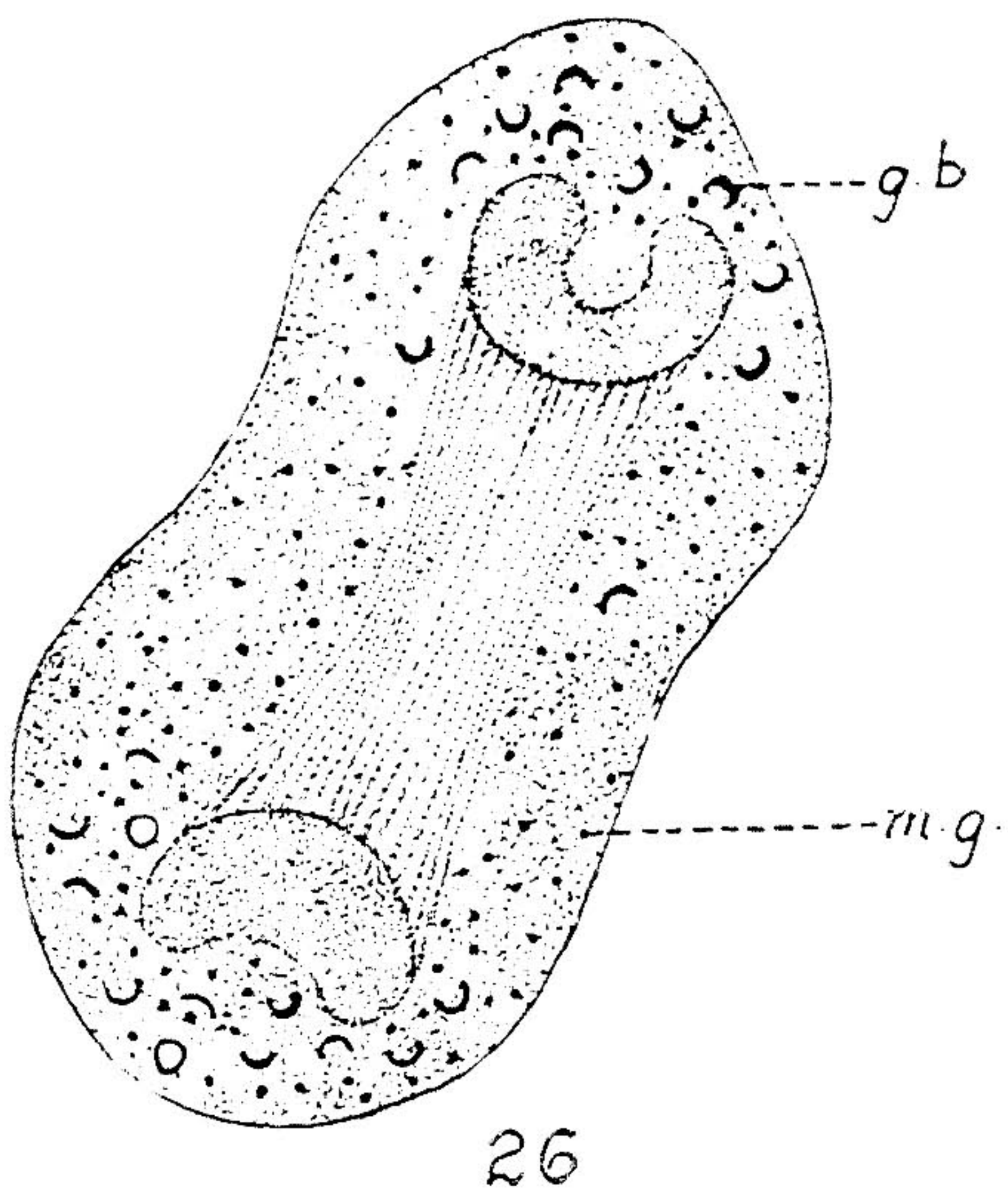
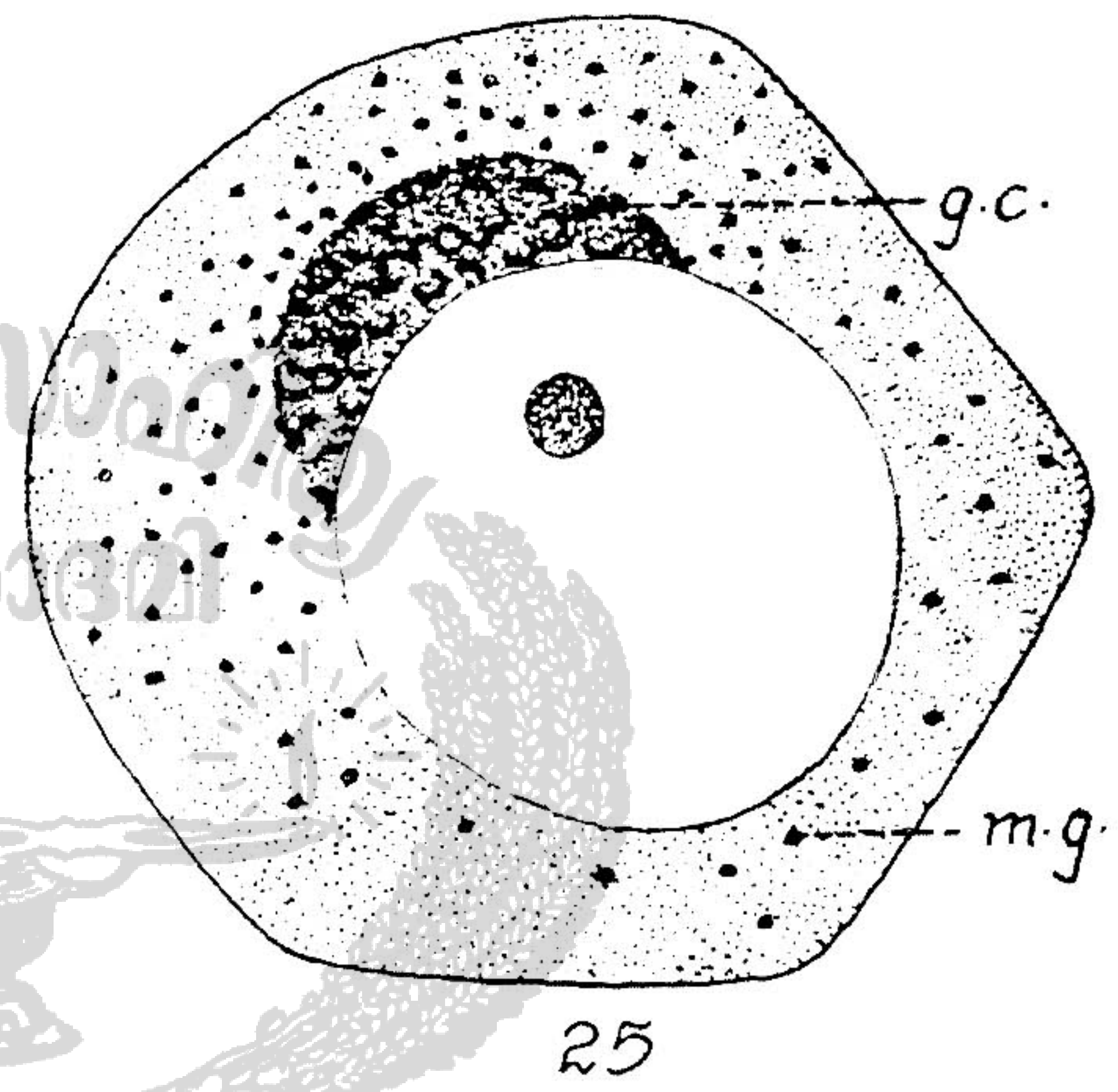
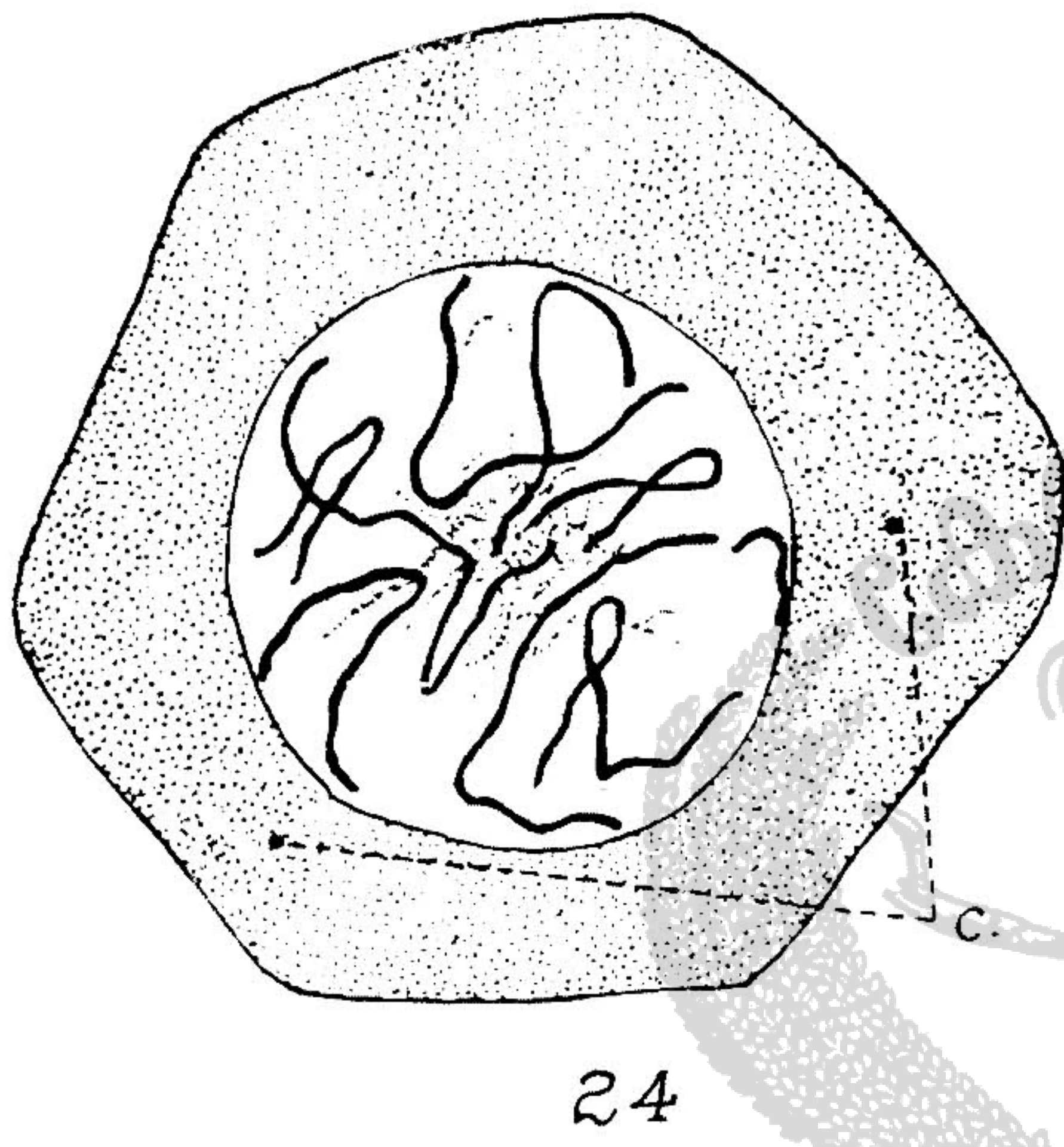
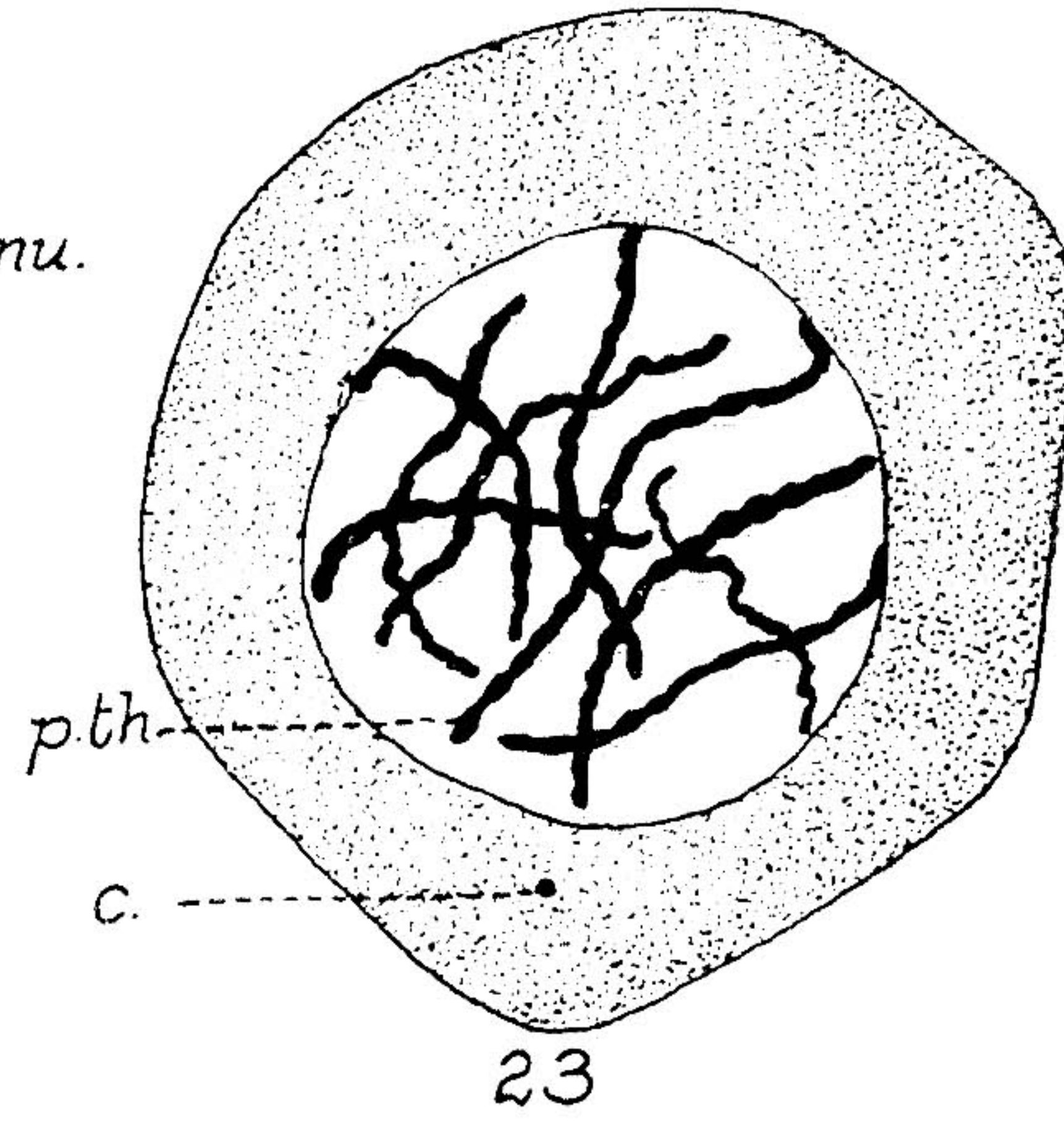
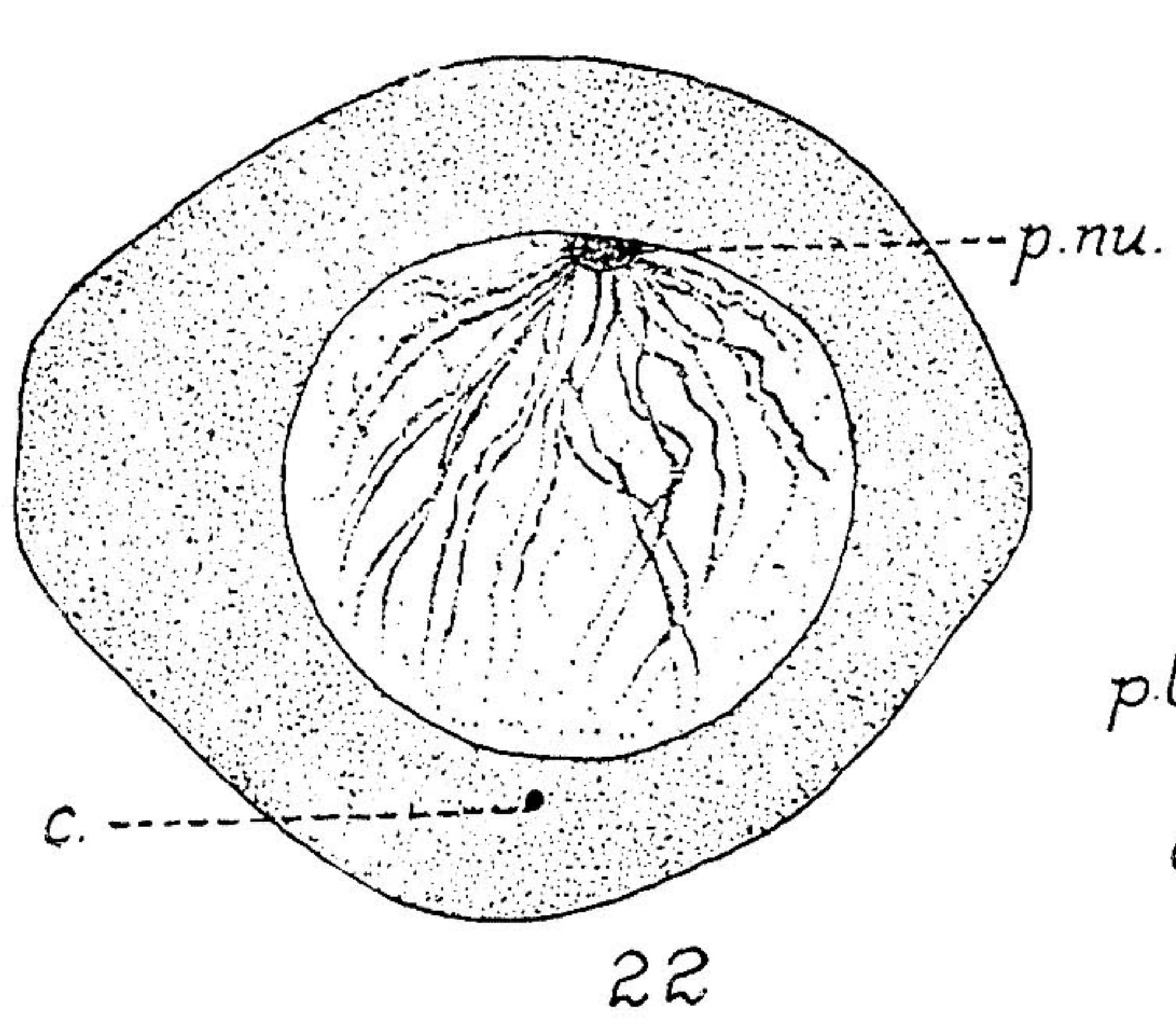
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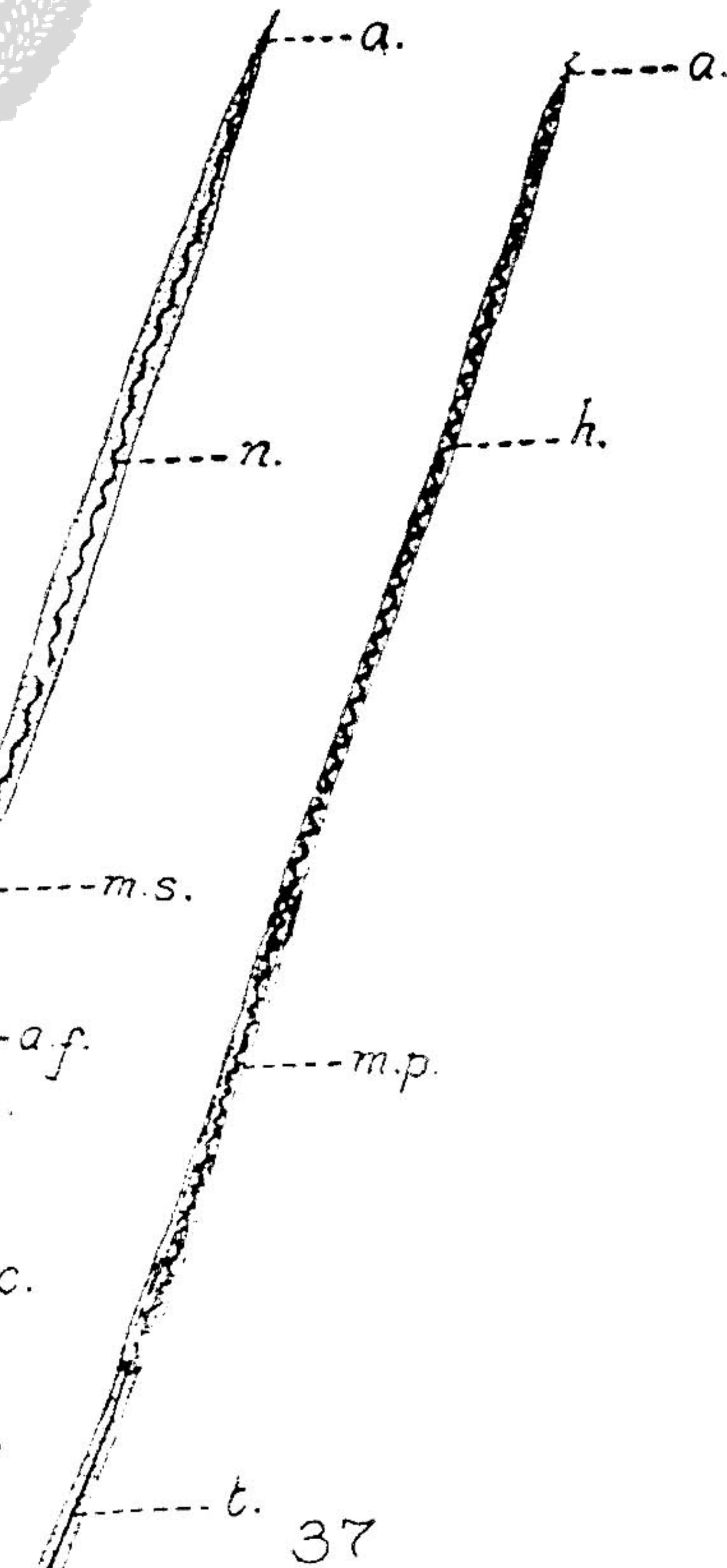
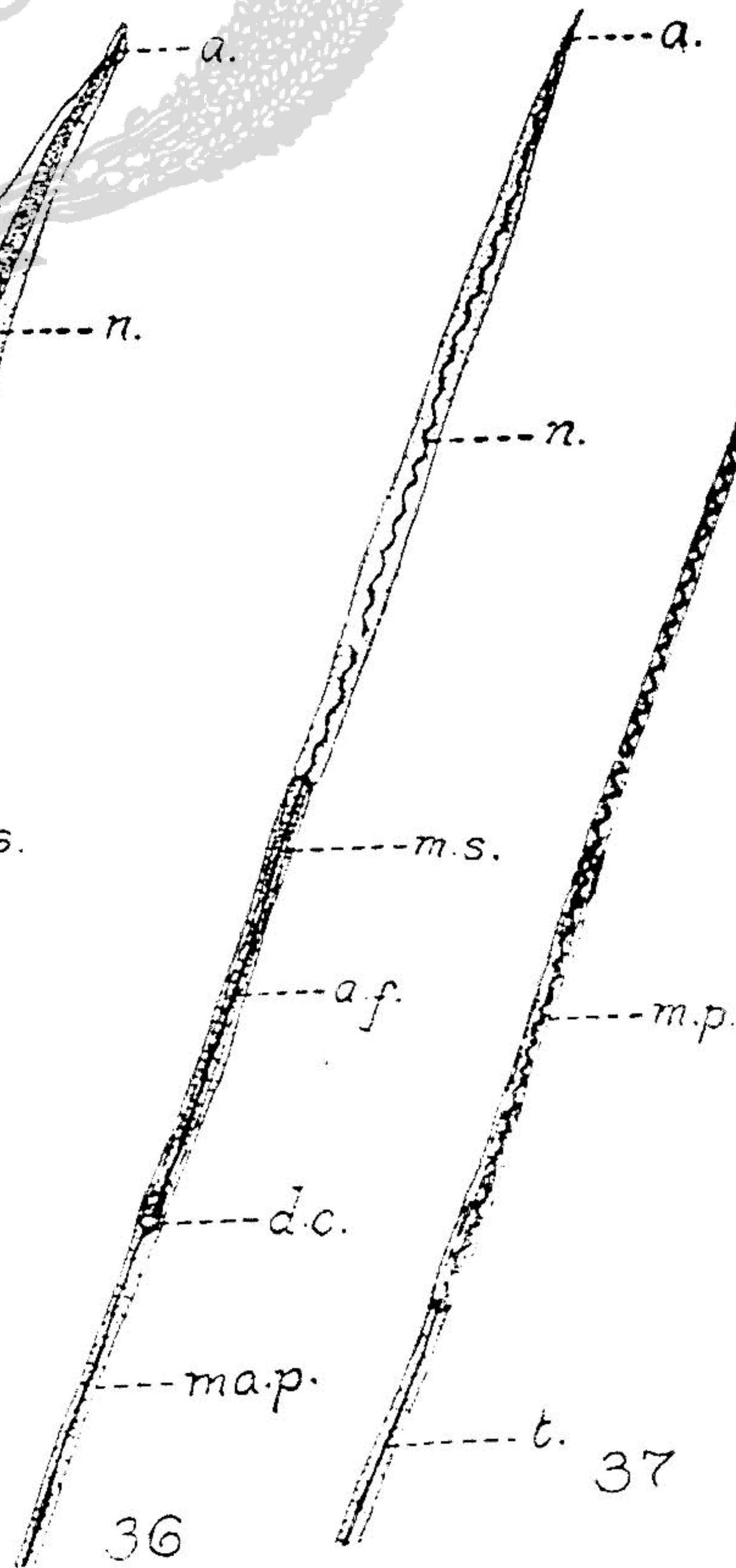
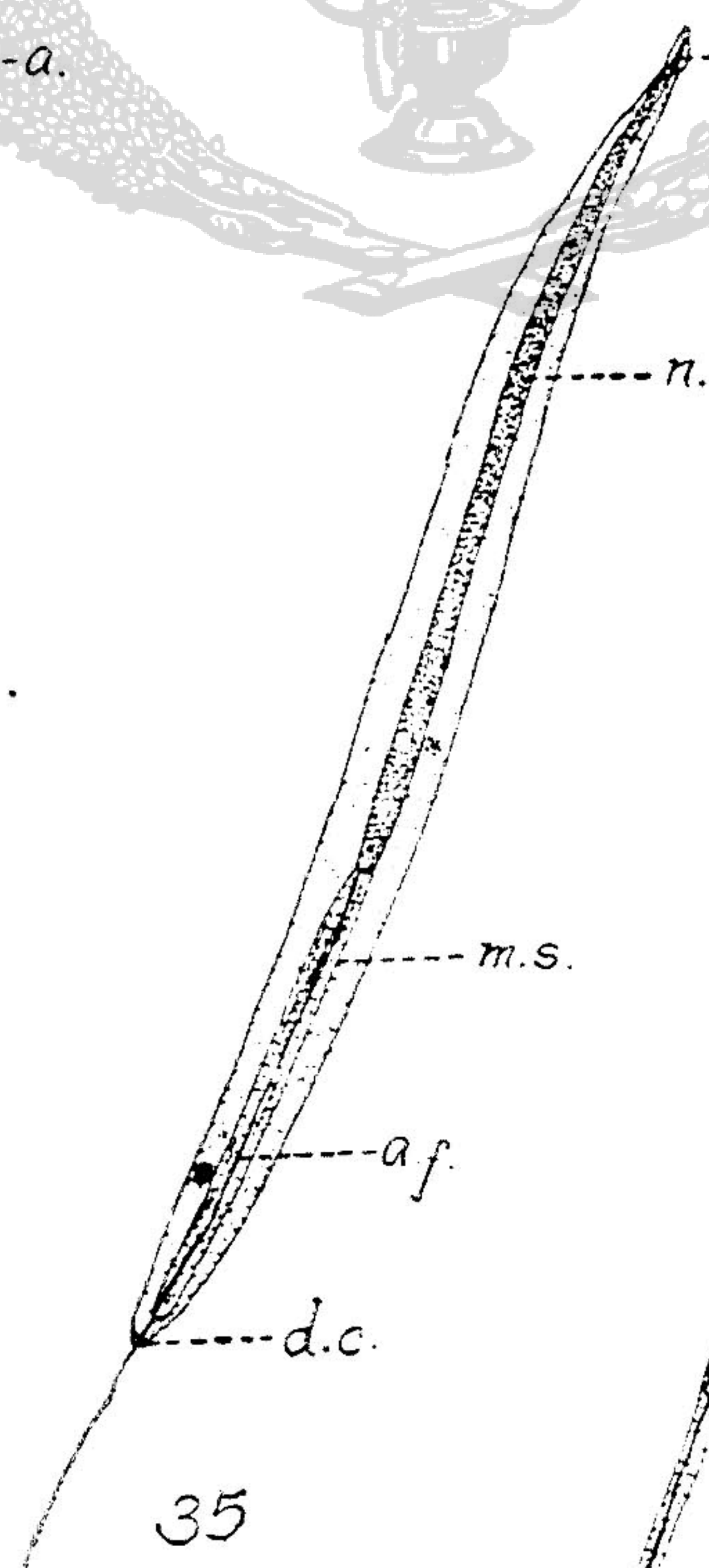
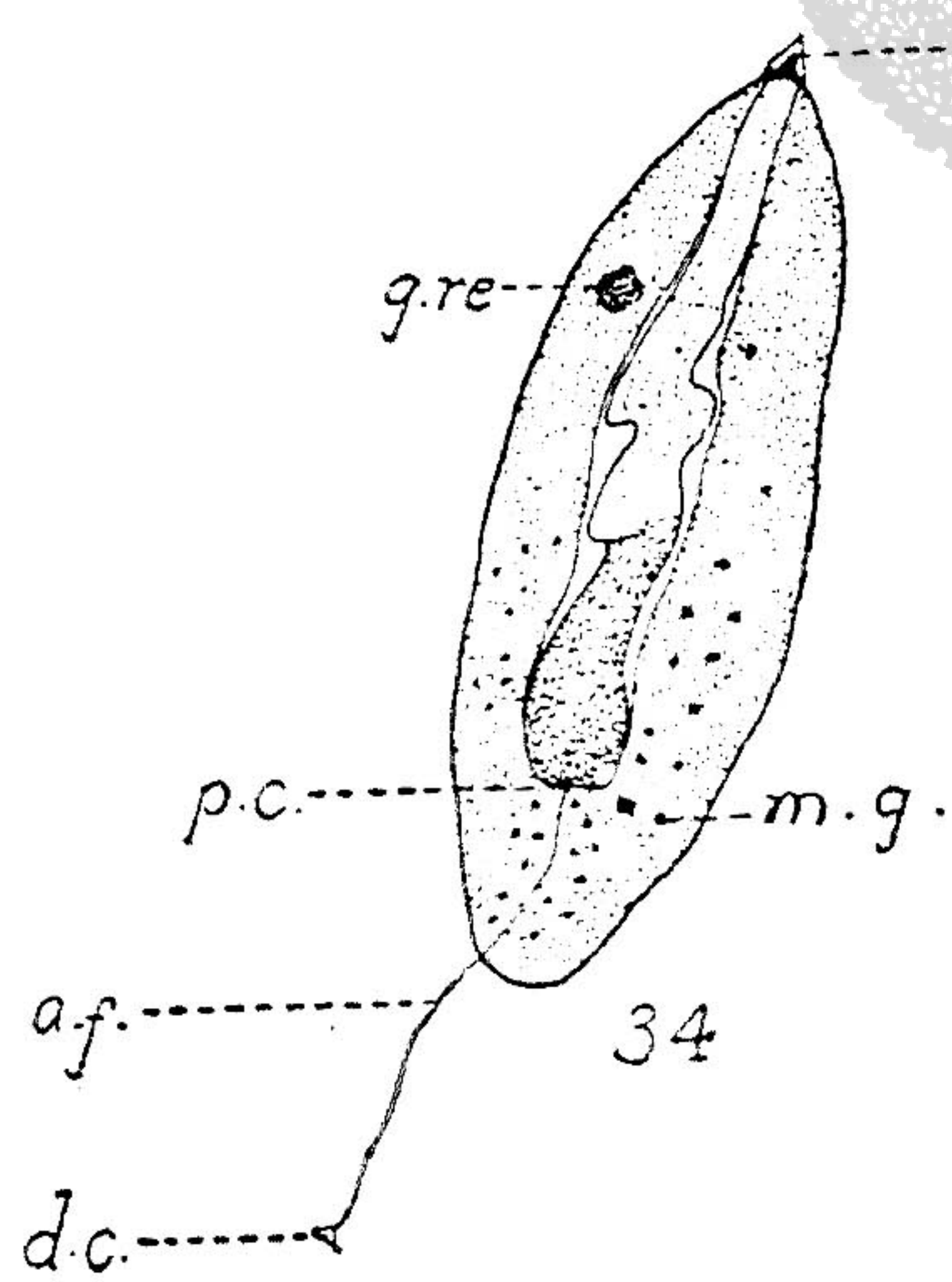
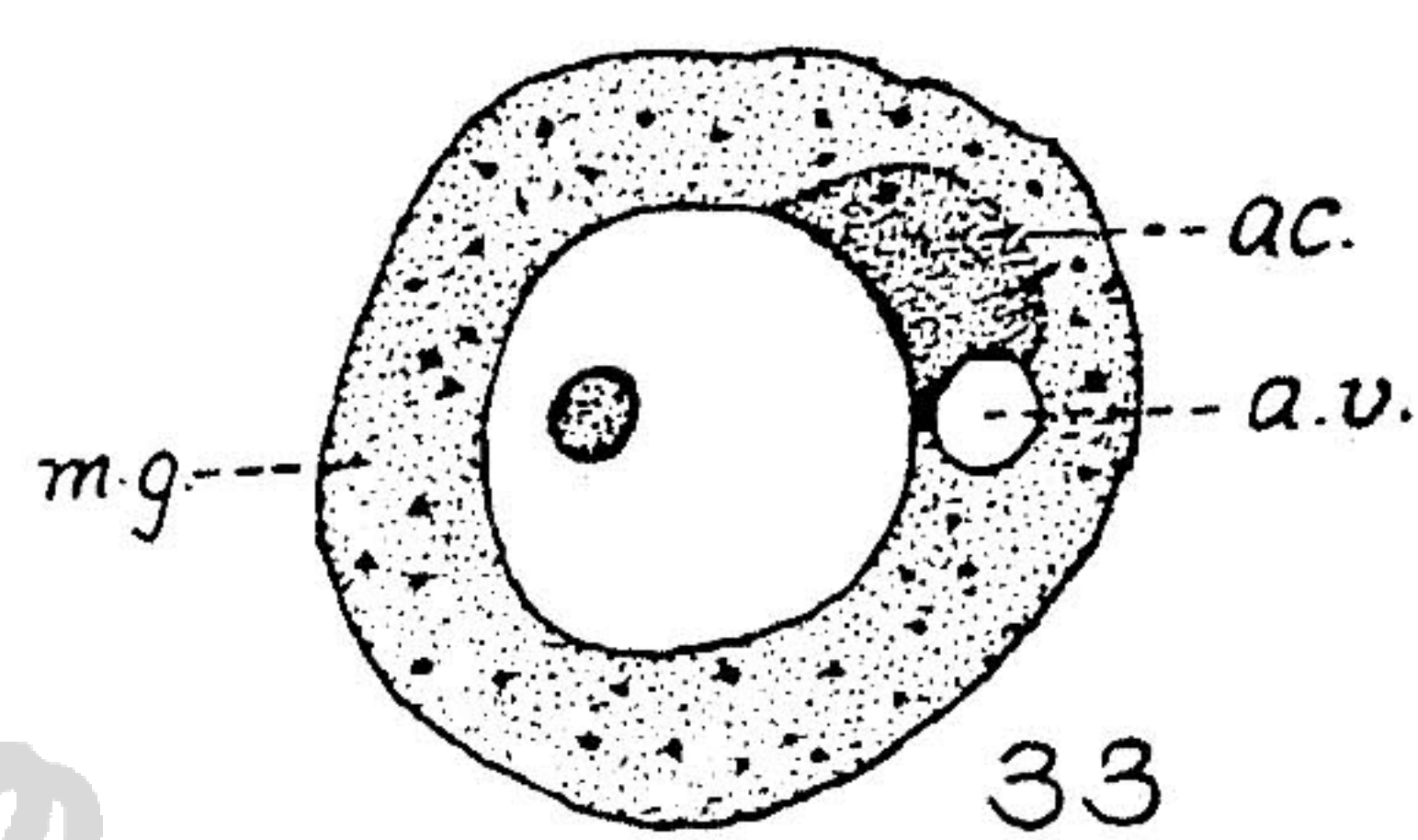
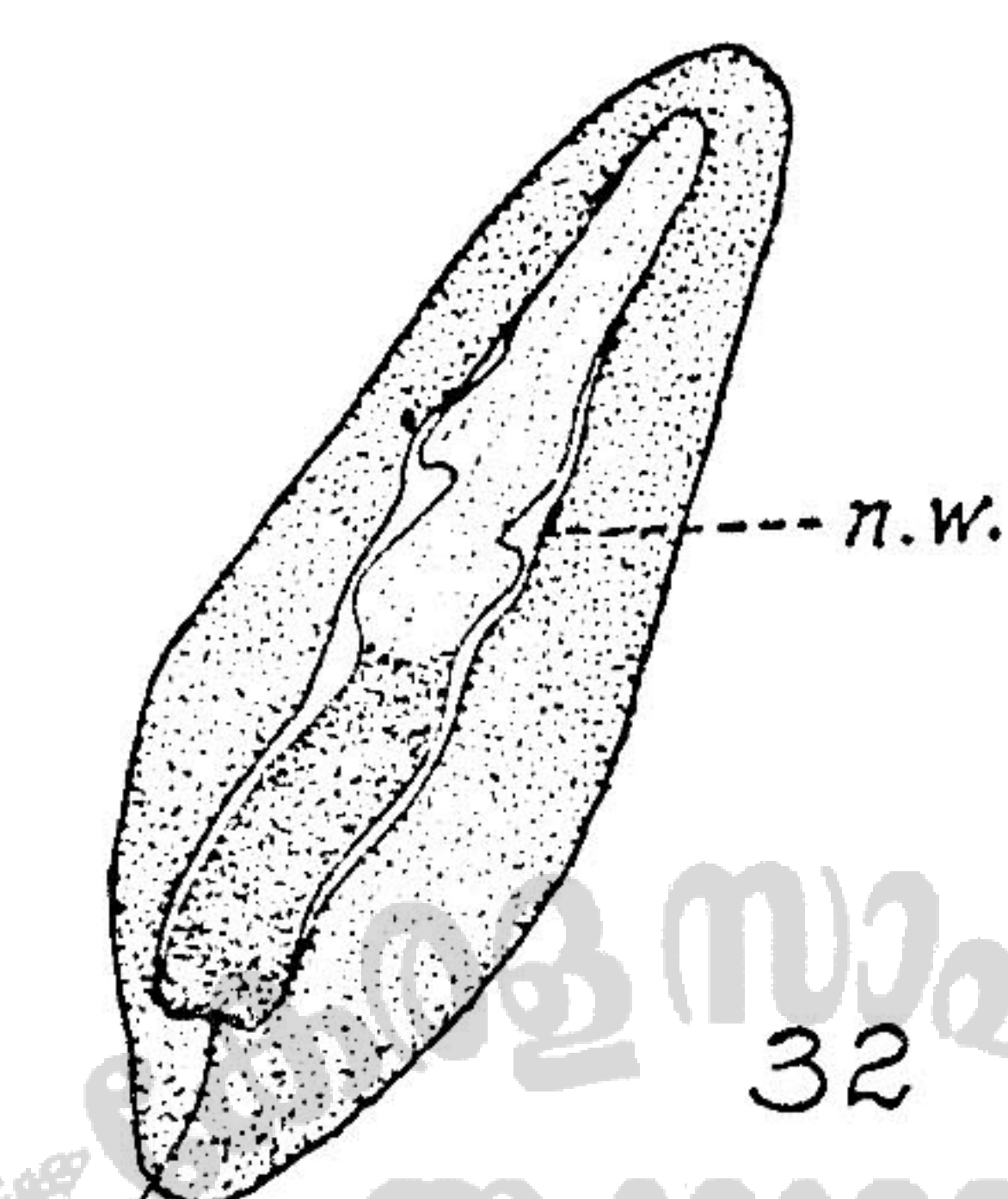
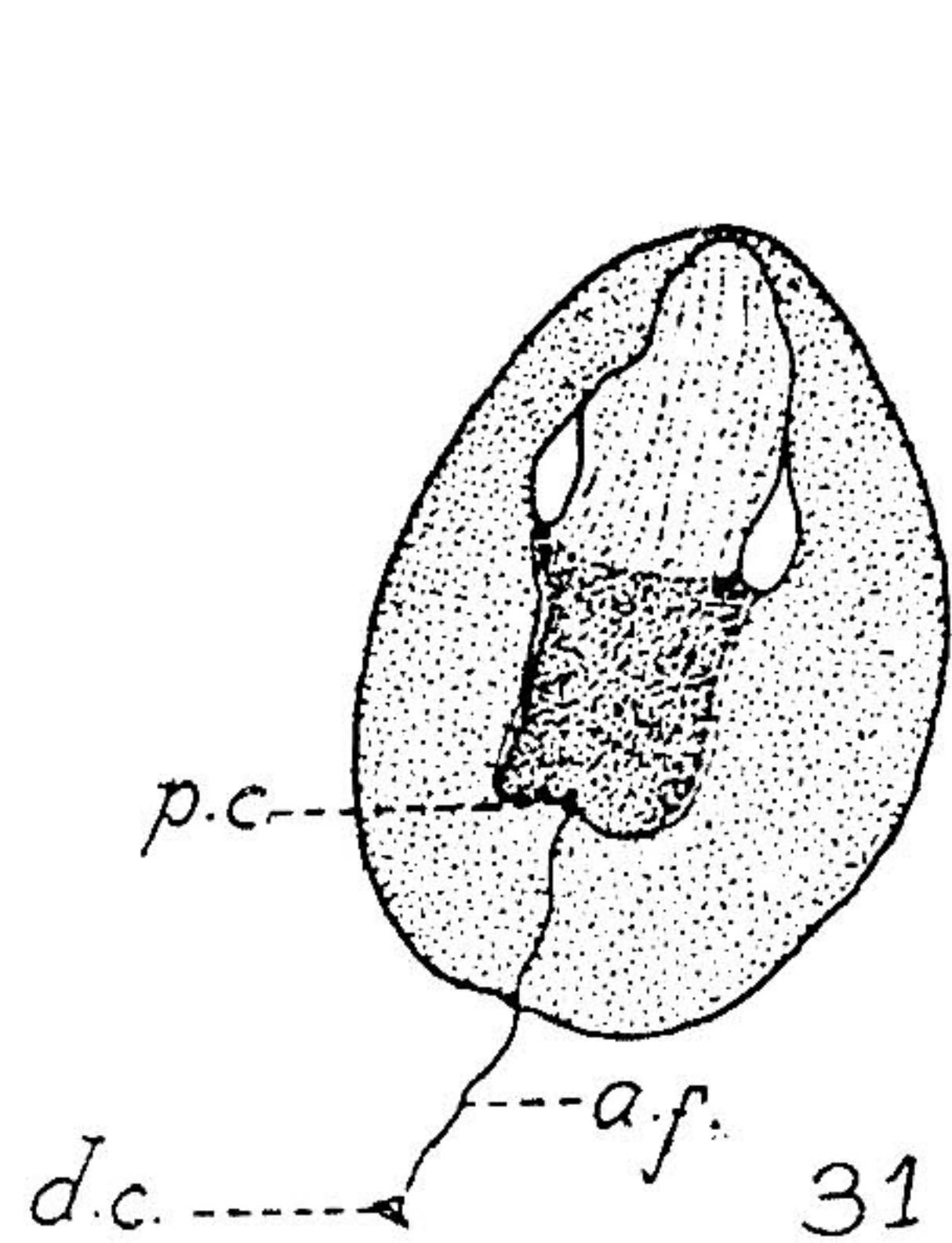
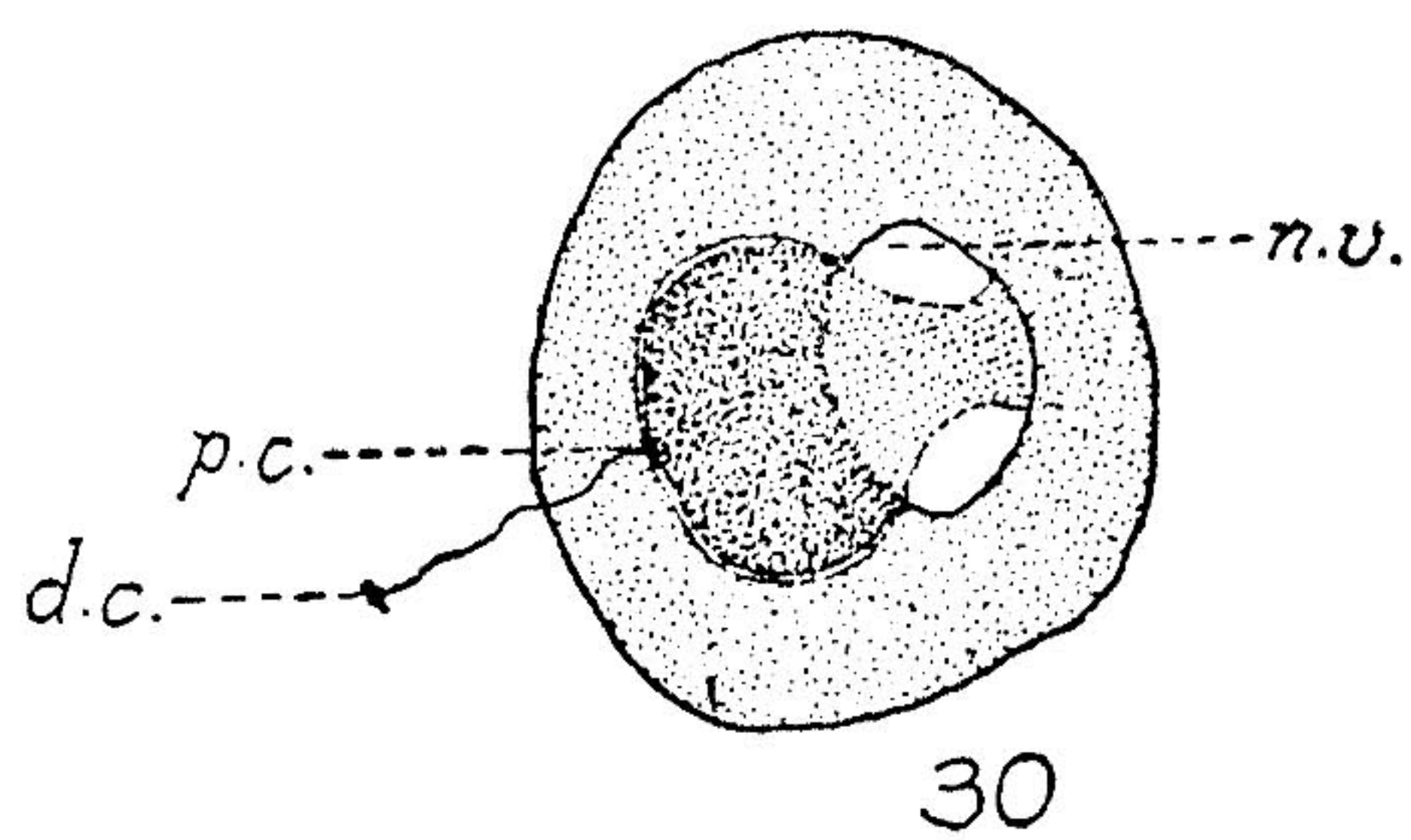
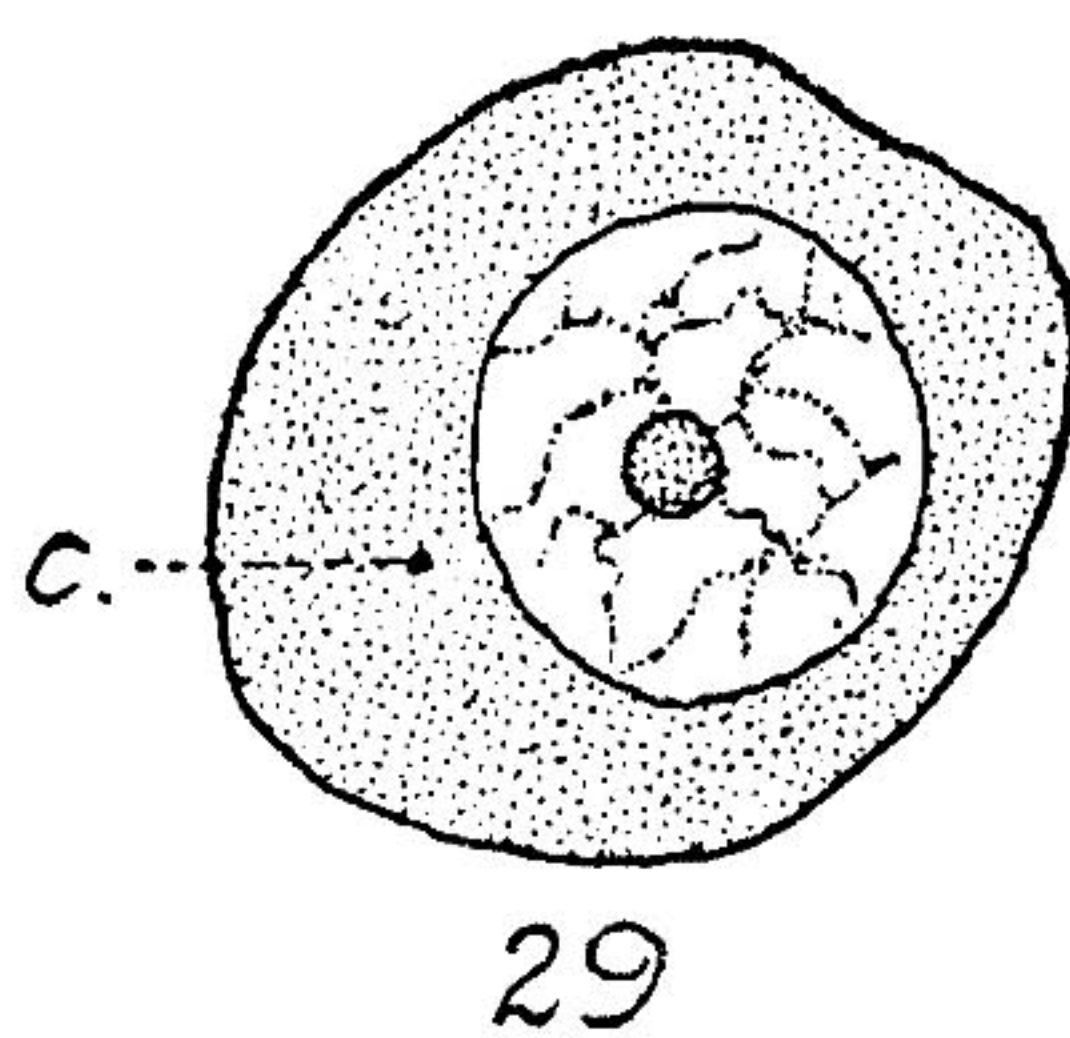
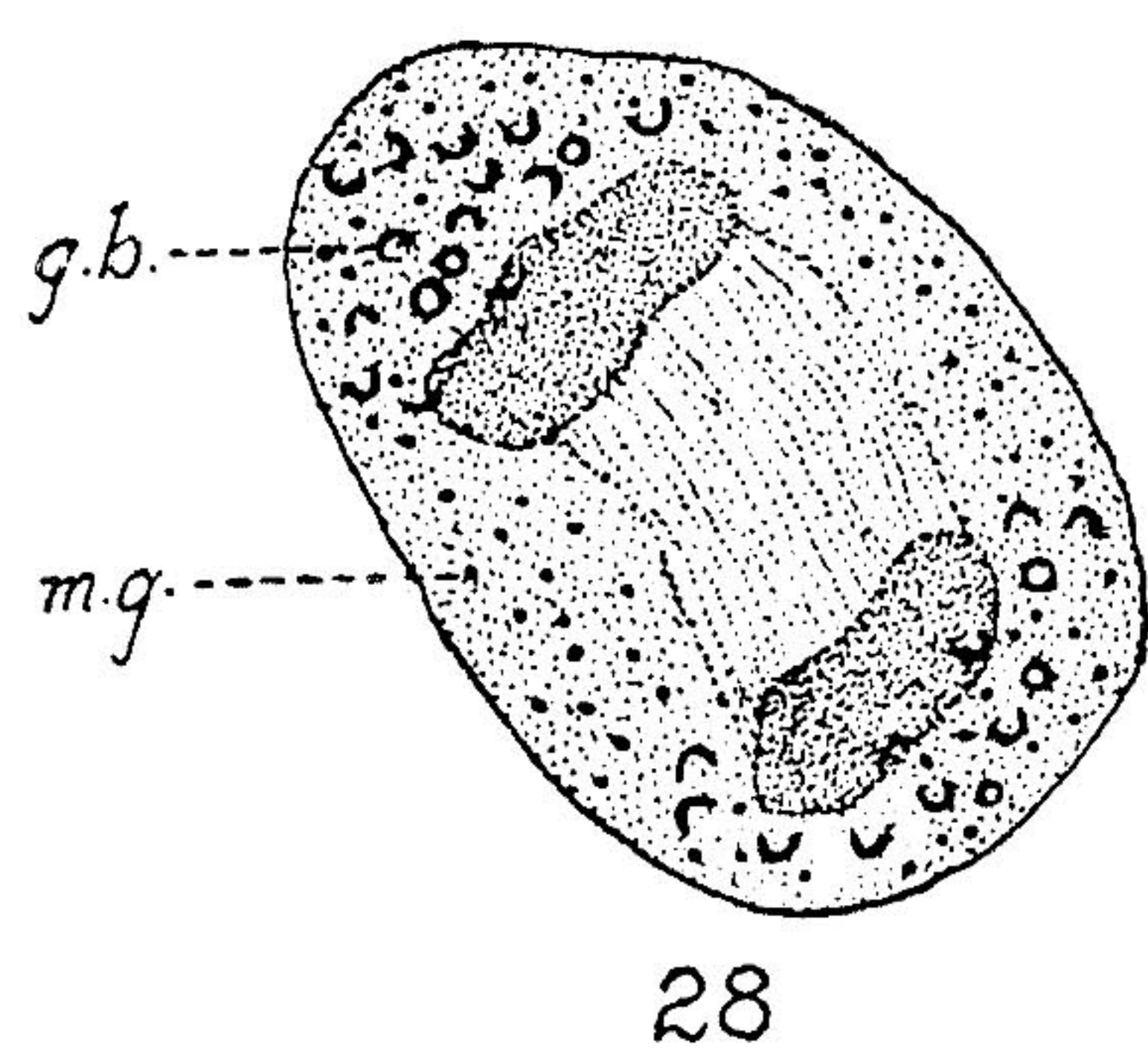
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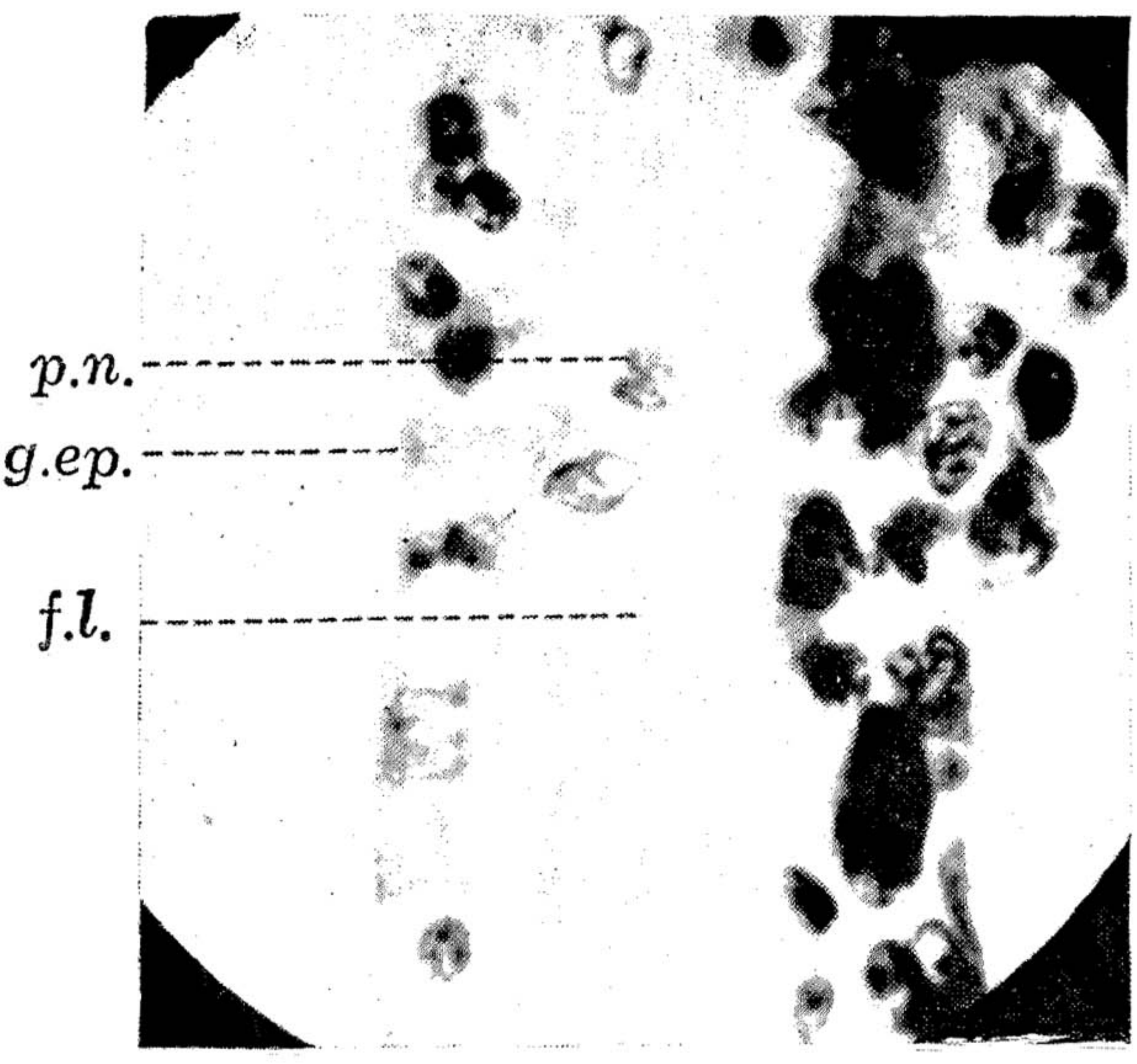
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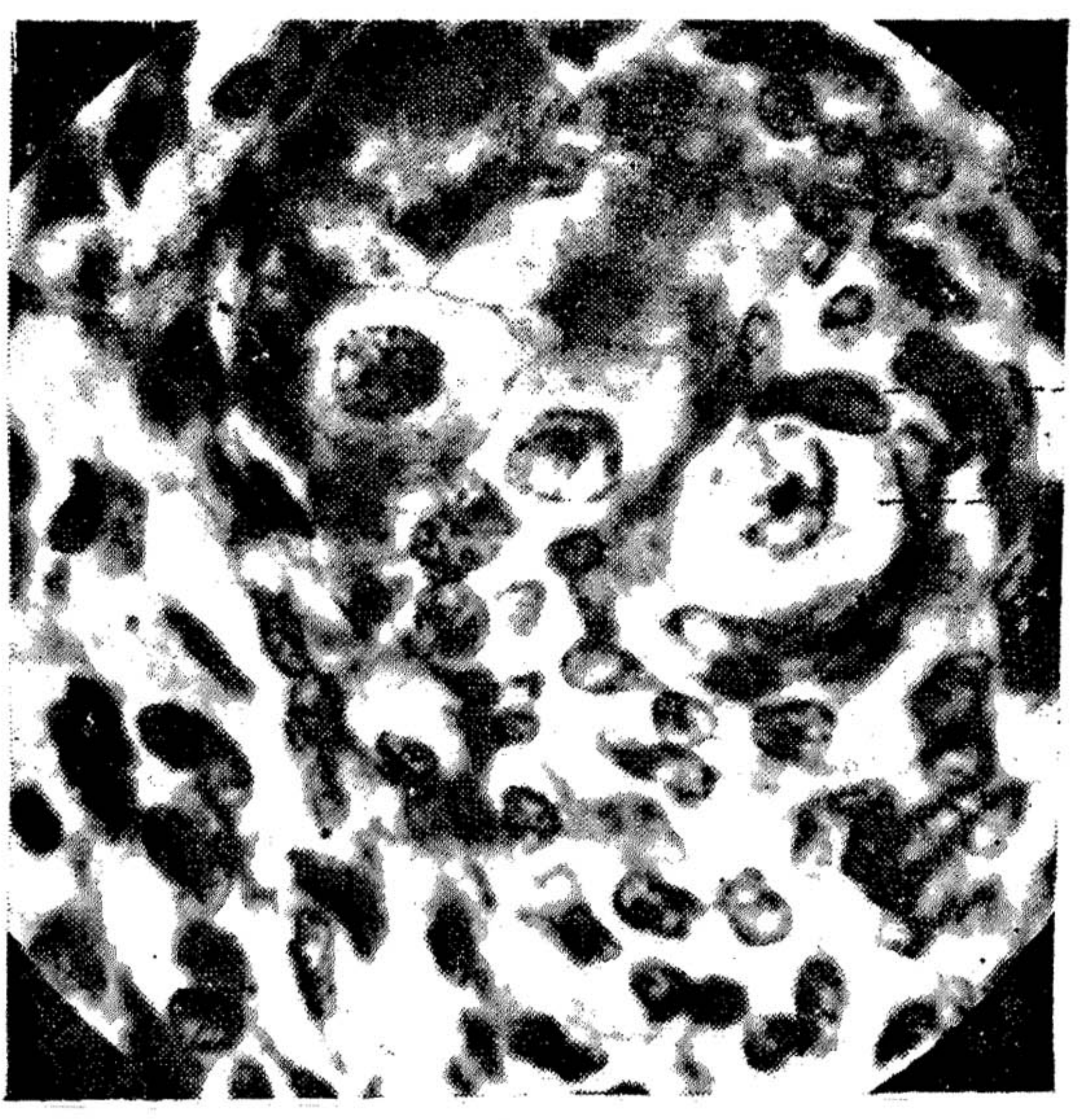




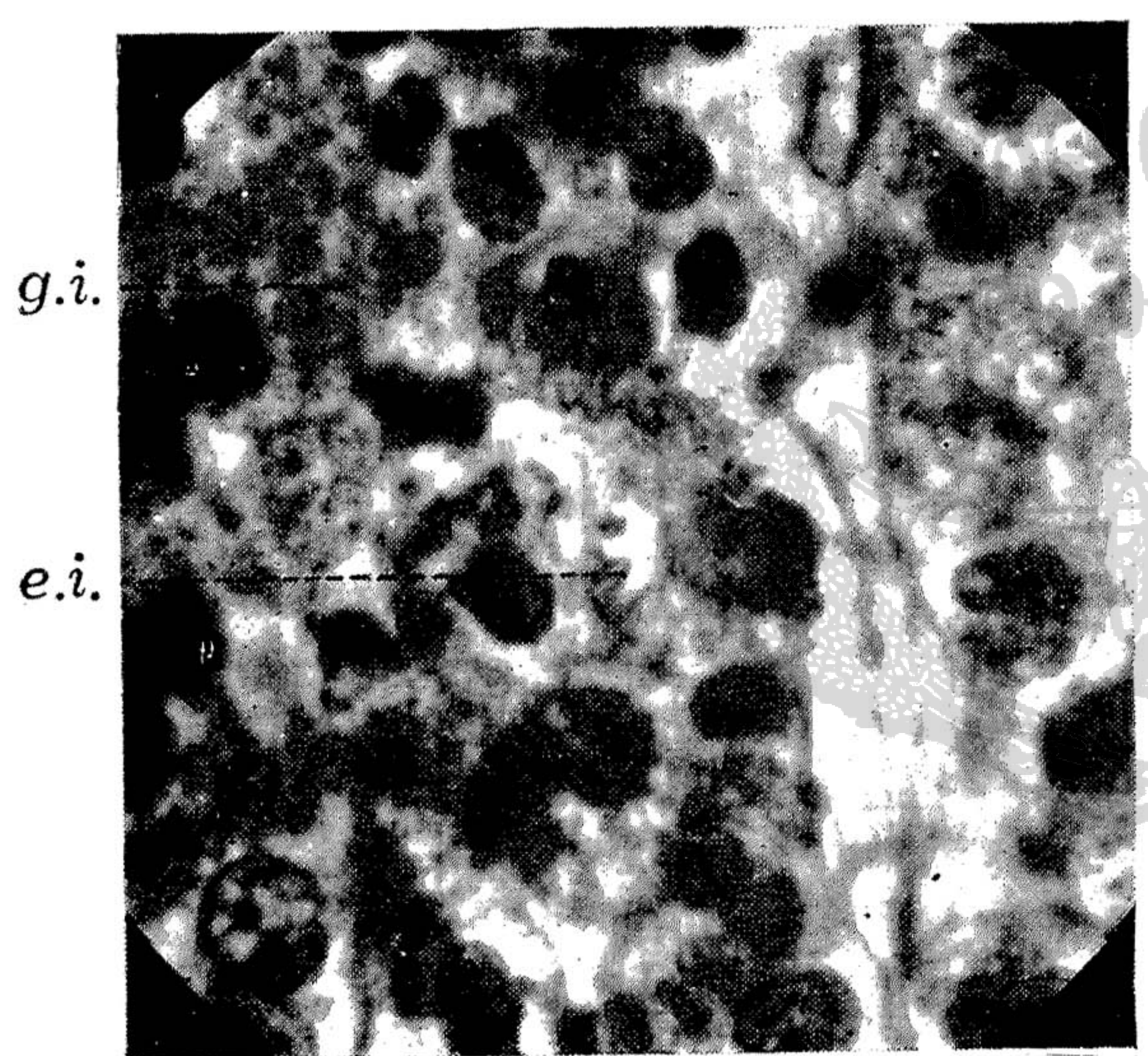




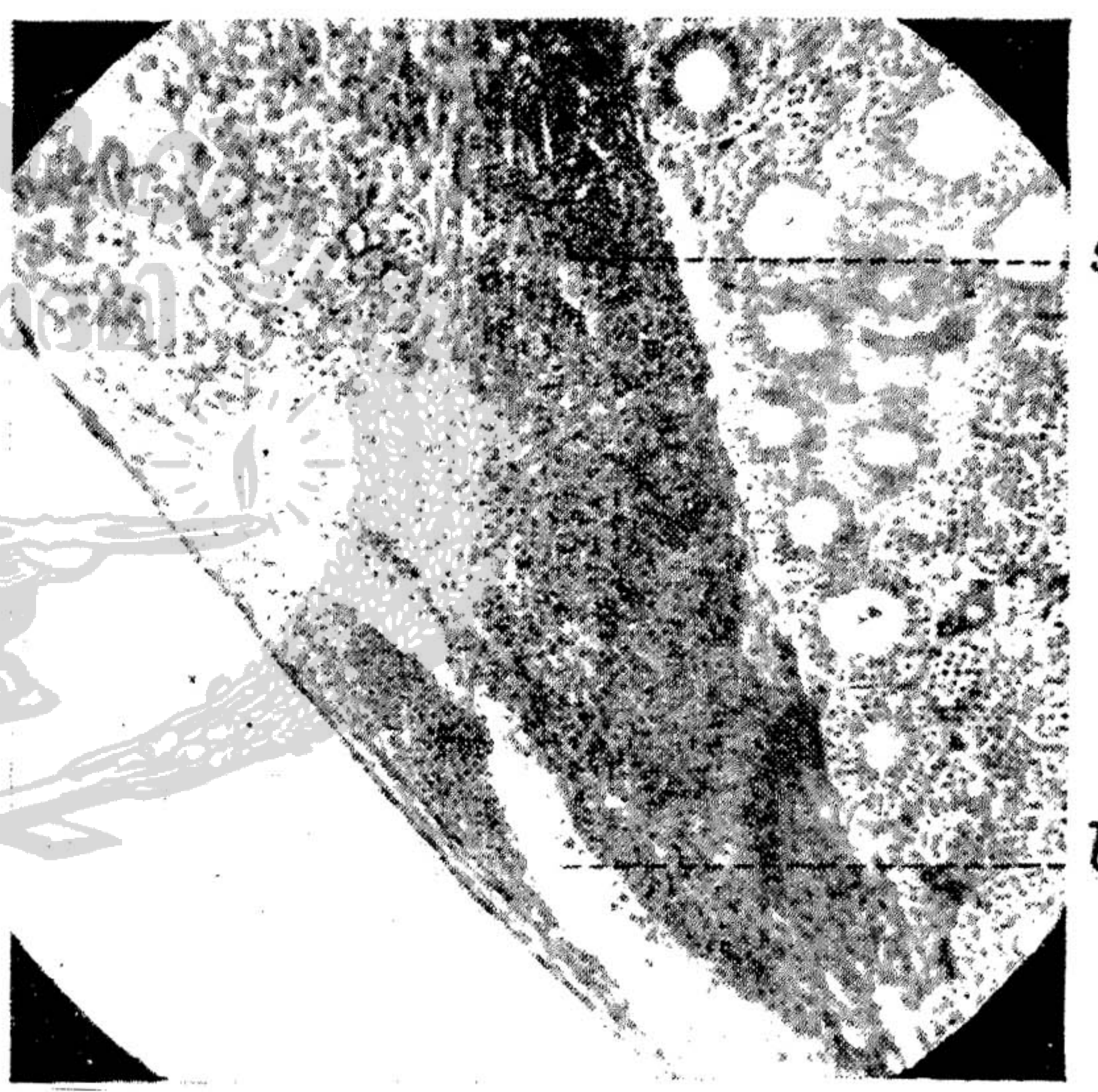
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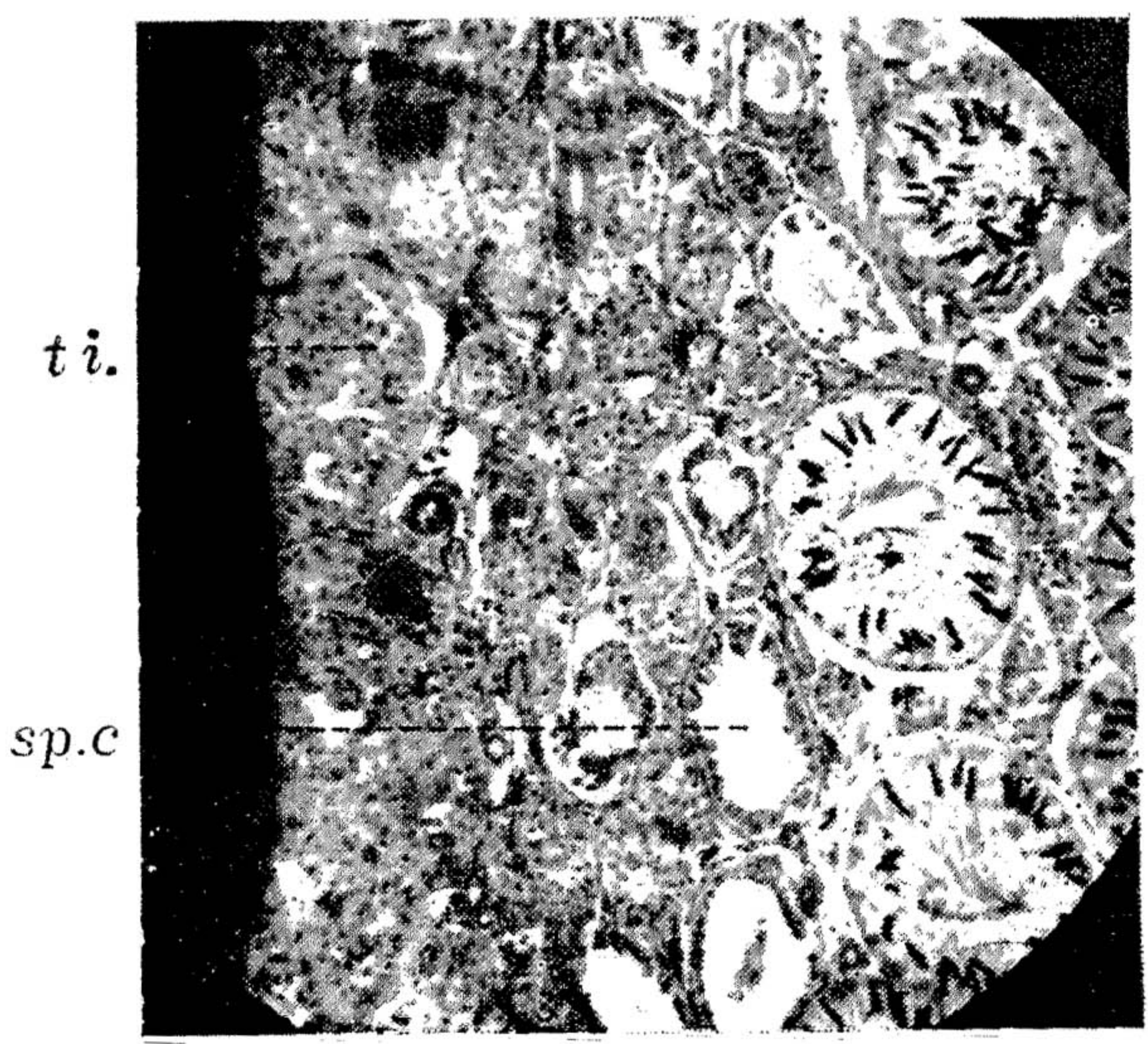
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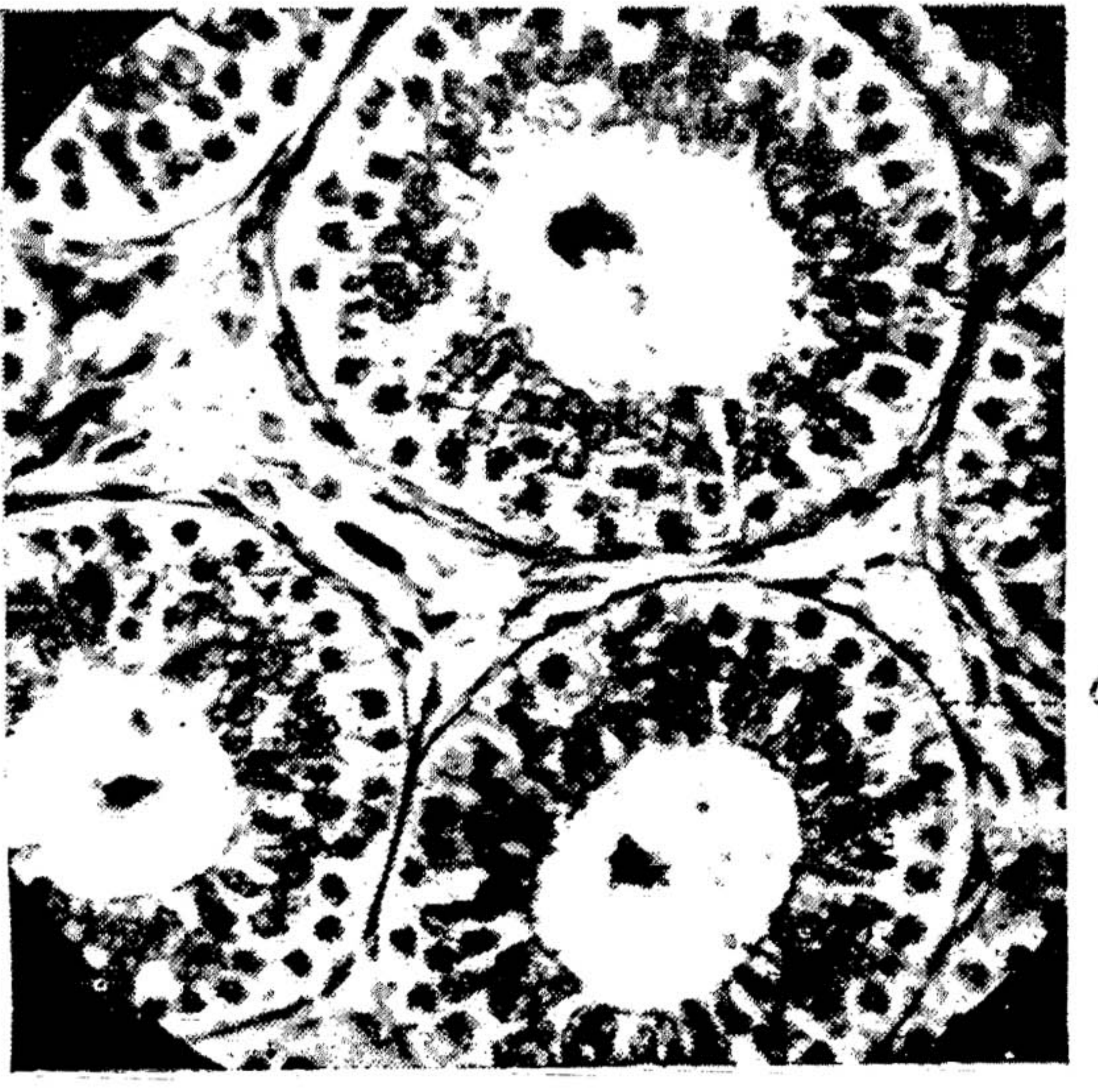
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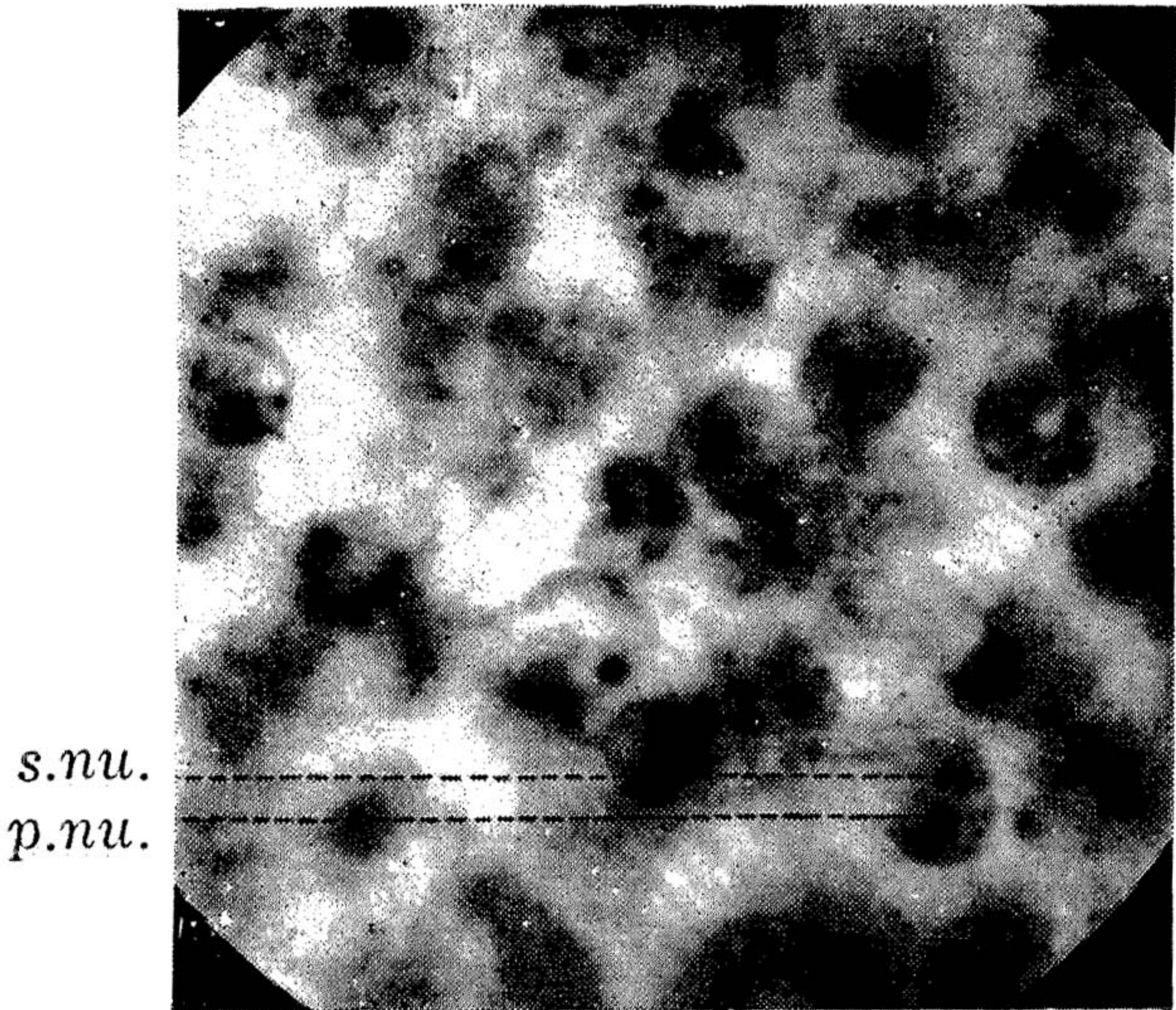
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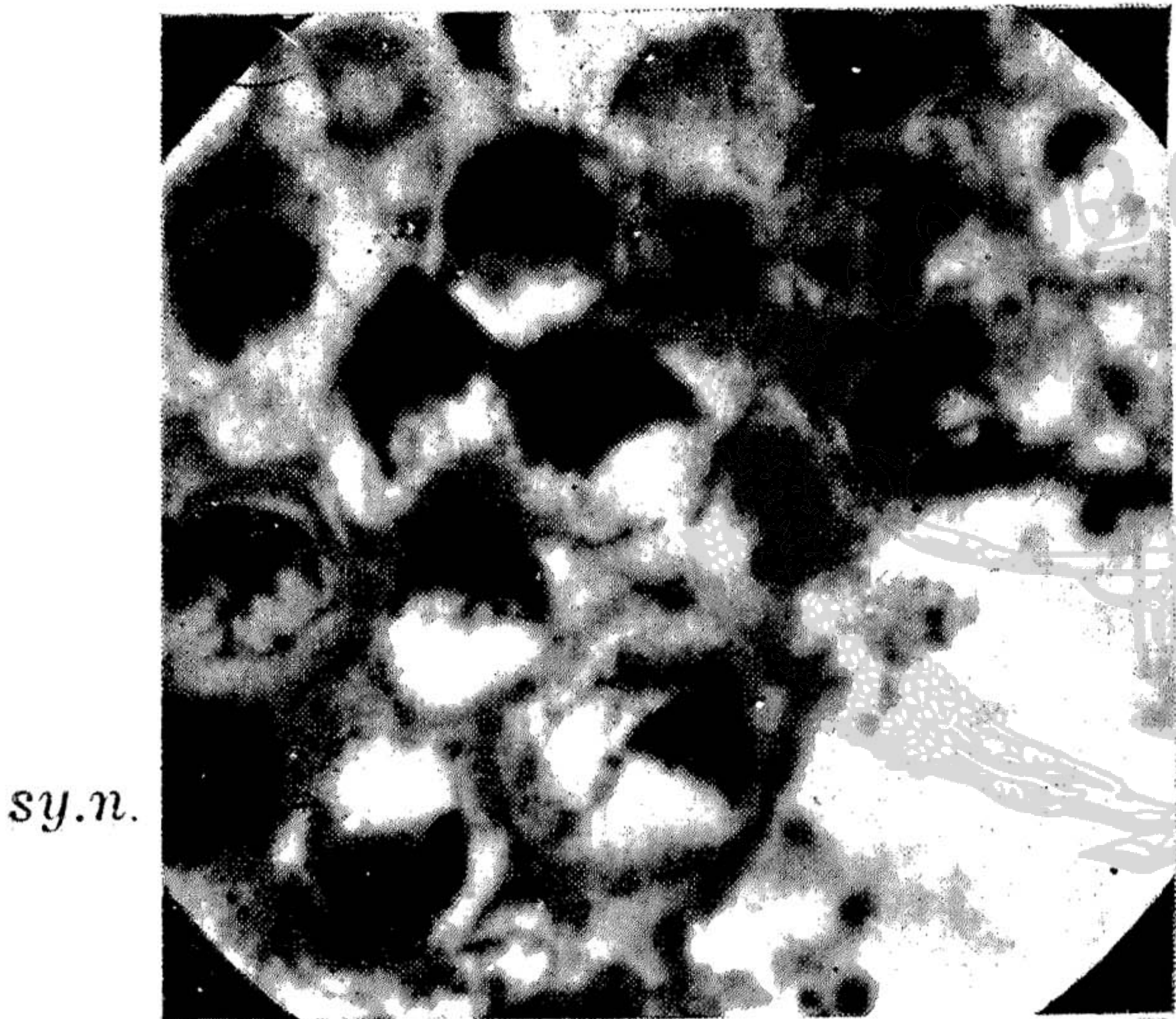
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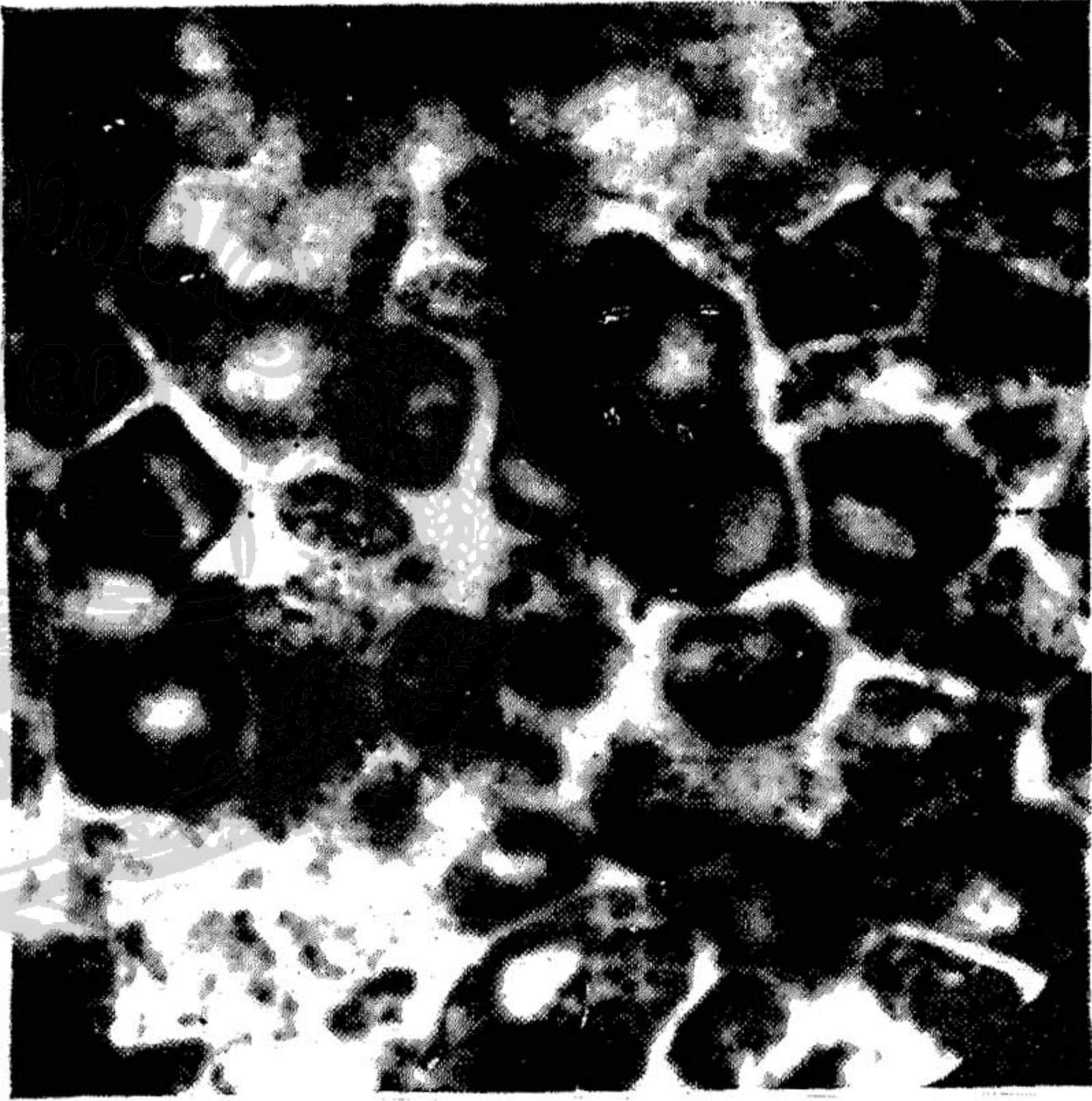
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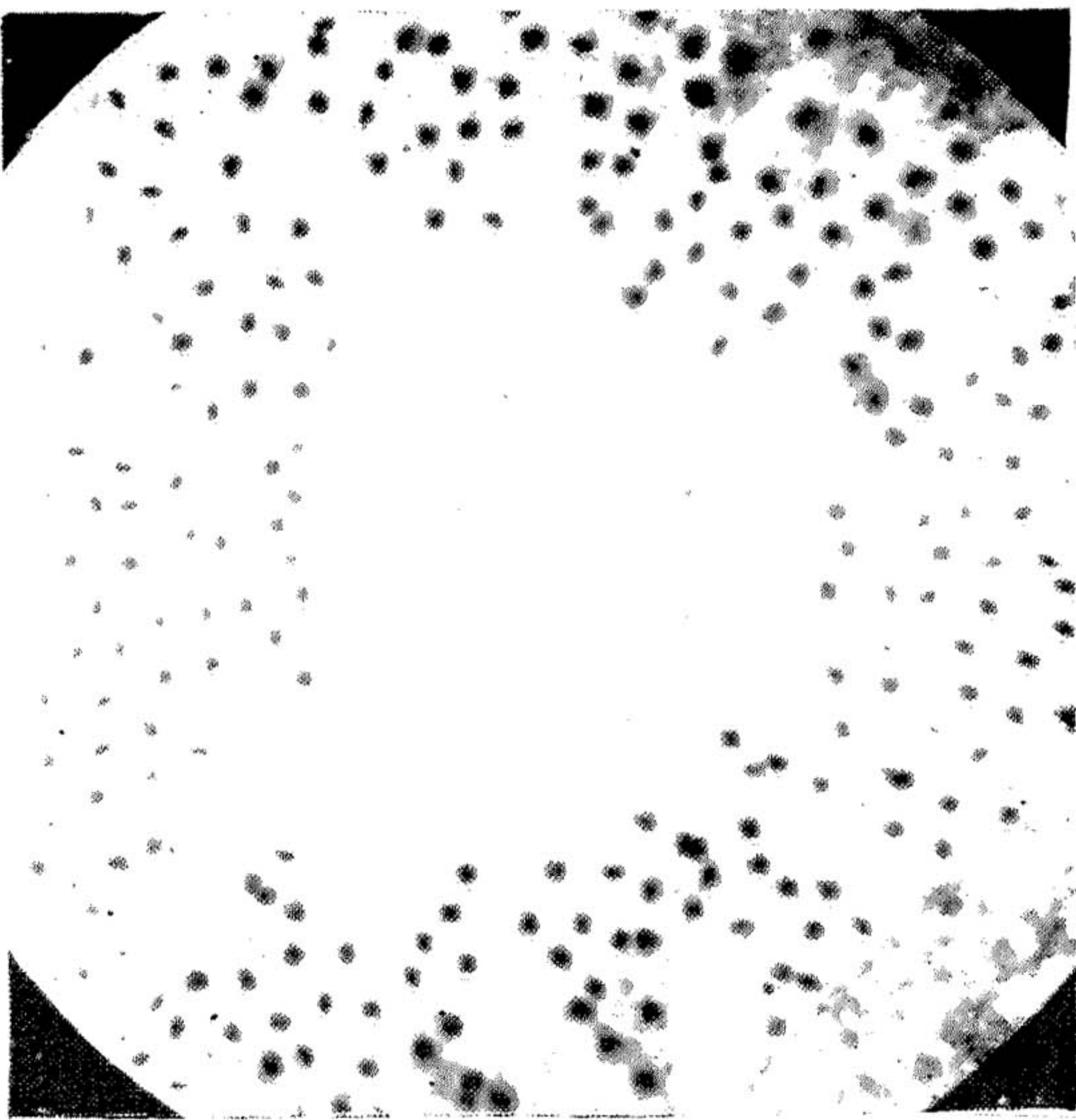
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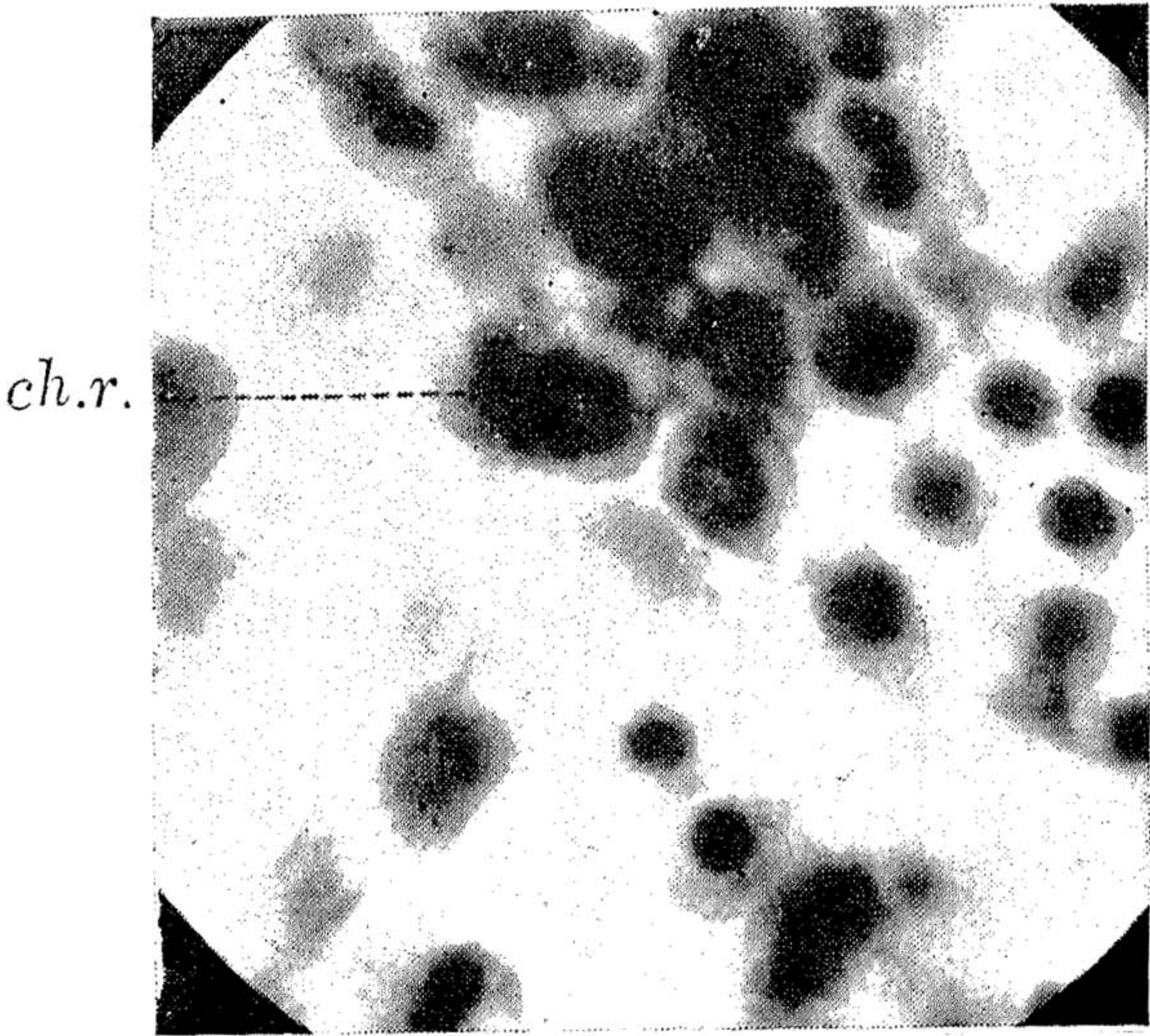
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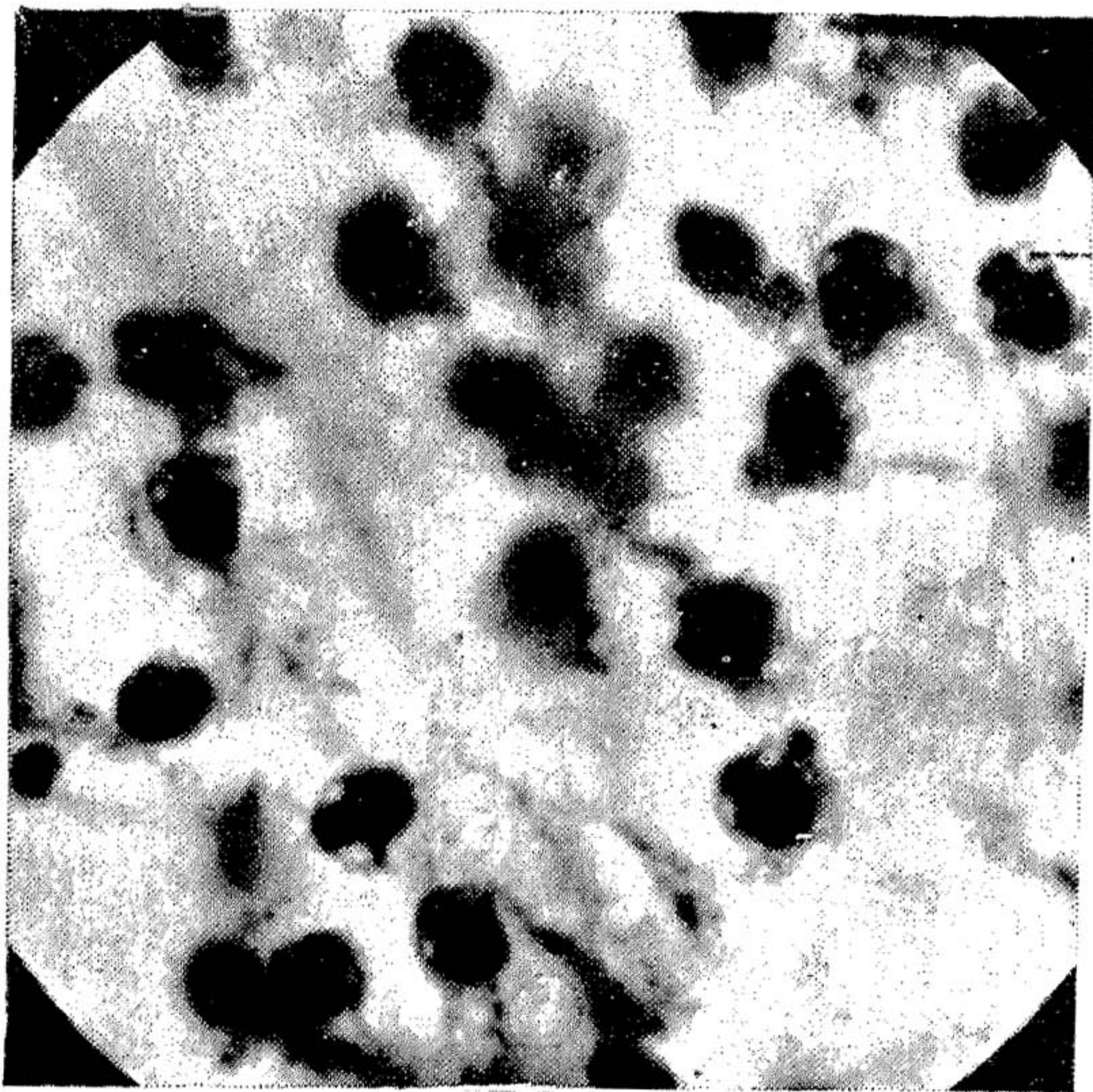
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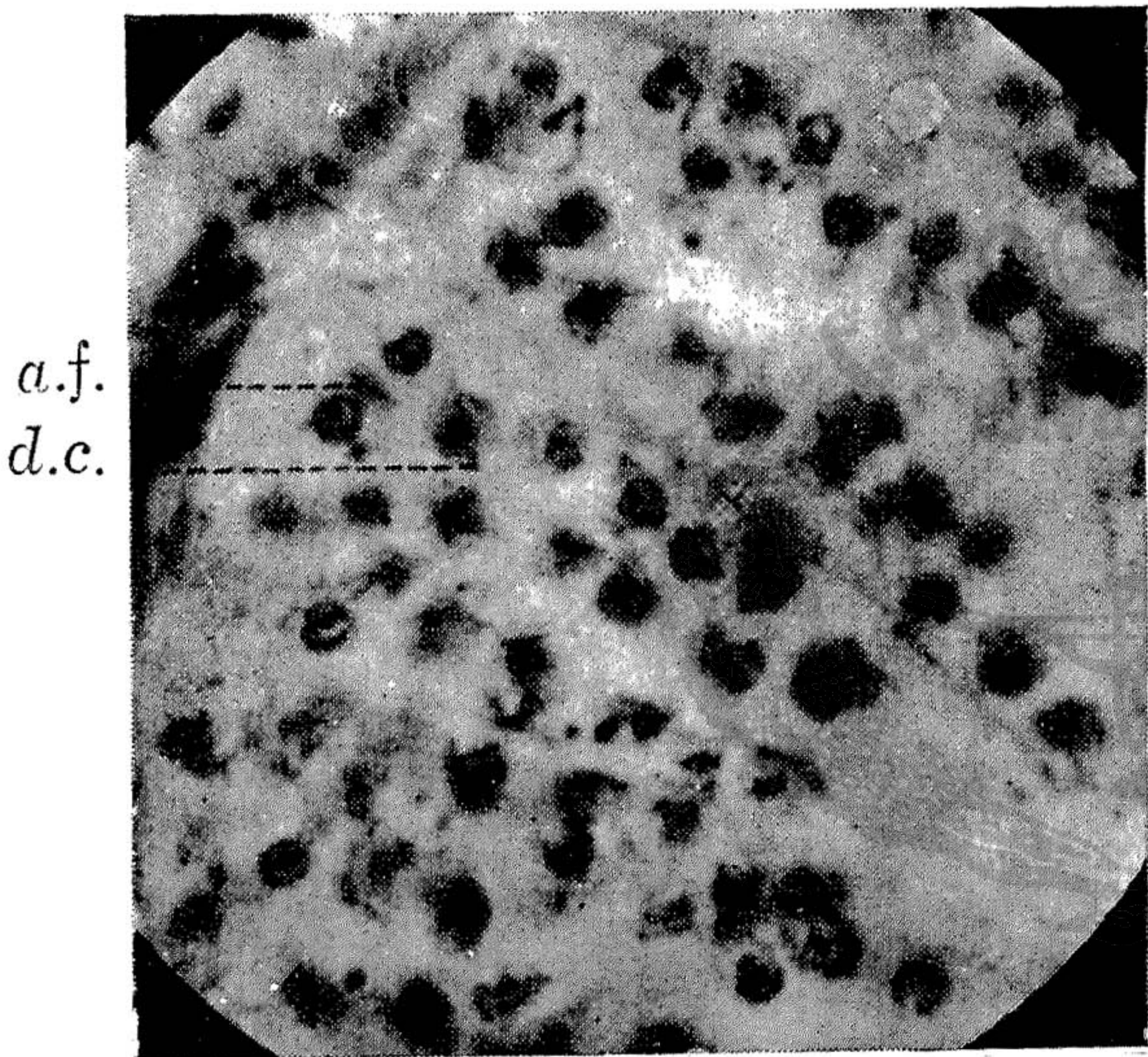
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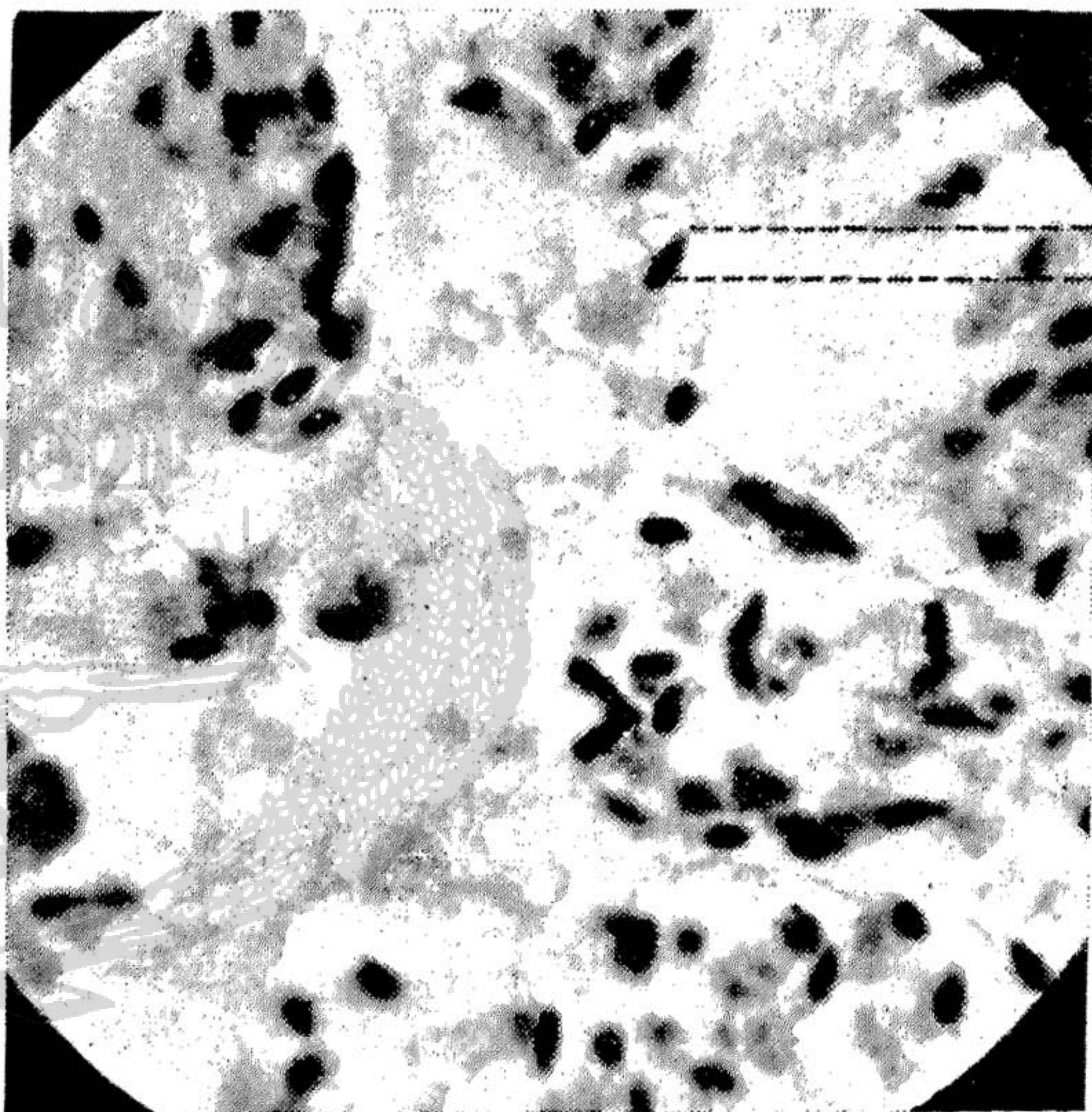
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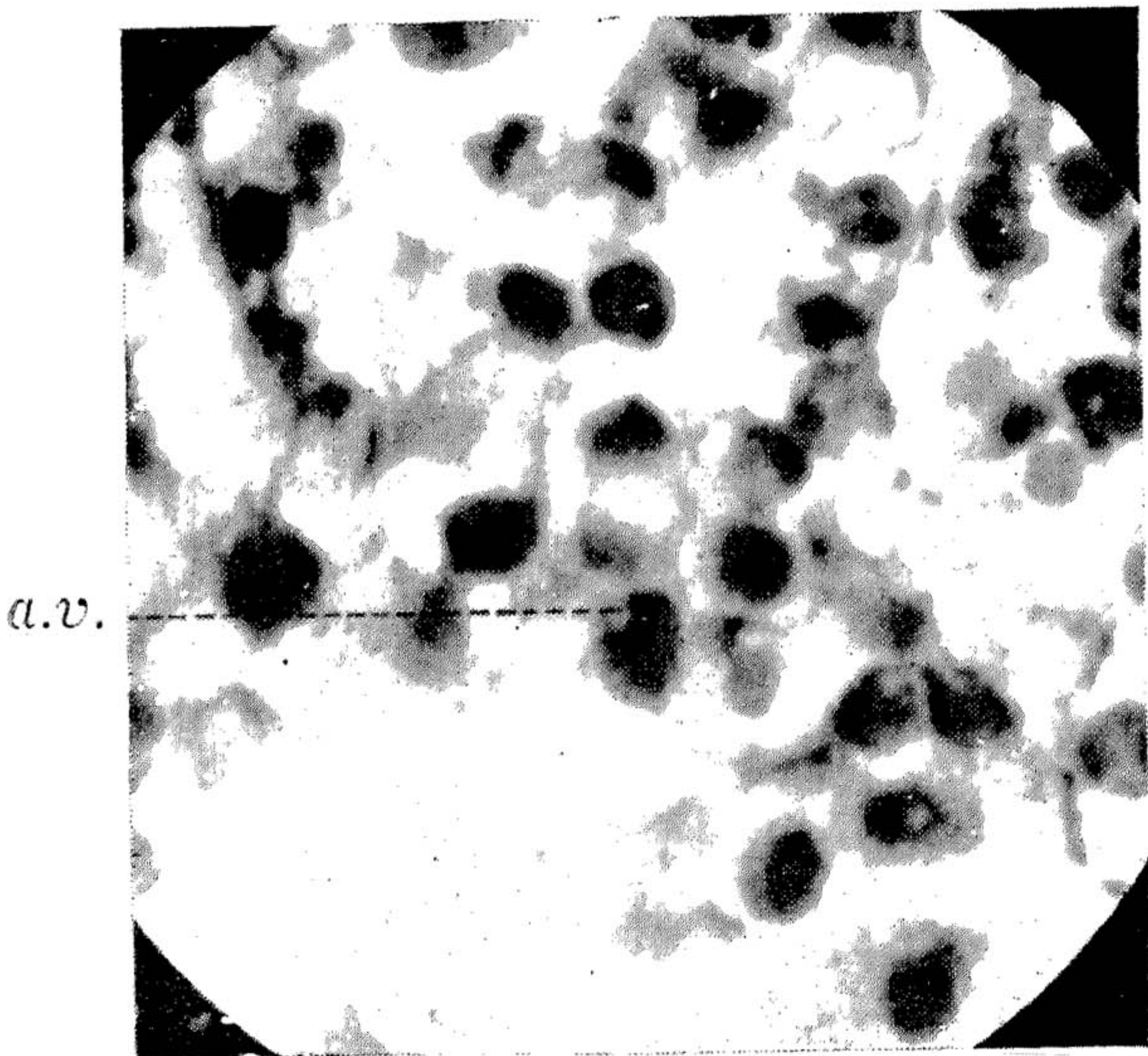
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EXPLANATION OF FIGURES

PLATE I.

1. A polymorphically nucleated cell. 20×100 . Bouin and Iron haematoxylin.
2. A spherically nucleated cell. 20×100 . Bouin and Iron haematoxylin.
3. A primary spermatogonium. 20×100 . Corrosive sublimate and Iron haematoxylin.
4. A primary spermatogonium showing the crescentic cap of granular mitochondria. 20×100 . Flemming without acetic and Iron haematoxylin.
5. A primary spermatogonium showing the disintegration of the mitochondrial cap. 20×100 . Flemming without acetic and Iron haematoxylin.
6. A primary spermatogonium showing the distribution of the mitochondria. 20×100 . Flemming without acetic and Iron haematoxylin.
7. A primary spermatogonium showing Golgi bodies at one pole of the cell. 20×100 . MannKopsch.
8. A primary spermatogonium showing the scattered arrangement of the Golgi rings and crescents. 20×100 . Nassanow.
9. A late stage of transformation of a polymorphically nucleated cell into a spherically nucleated cell showing the evolution of the network of chromatin within the nucleus. A nucleolus is absent. 20×100 . Carnoy and Iron haematoxylin.
10. A primary spermatogonium showing the appearance of a distinct nucleolus. 20×100 . Bouin and Iron haematoxylin.
11. A primary spermatogonium showing the formation of chromosomes. 20×100 . Carnoy and Iron haematoxylin.

PLATE II.

12. A primary spermatogonium showing the metaphase stage. 20×100 . Carnoy and Iron haematoxylin.
13. A primary spermatogonium showing the anaphase stage. 20×100 . Carnoy and Iron haematoxylin.
14. A primary spermatogonium showing the telophase stage. 20×100 . Carnoy and Iron haematoxylin.
15. A primary spermatogonium showing the chromosomal ring in the telophase stage. 20×100 . Carnoy and Iron haematoxylin.
16. Late anaphase stage of a primary spermatogonium showing the distribution of the Golgi and mitochondrial elements. 20×100 . Nassanow.

17. A secondary spermatogonium. The centrosome is distinct. 20×100 . Corrosive sublimate and Iron haematoxylin.
18. A secondary spermatogonium, showing the Golgi bodies and mitochondrial granules. 20×100 . MannKopsch.
19. A primary spermatocyte showing the presence of primary and secondary nucleoli. The centrosome is very prominent. 20×100 . Bouin and Iron haematoxylin.
20. A primary spermatocyte showing the contraction of the chromatic thread work to one side of the nucleus. The two nucleoli are still present. 20×100 . Bouin and Iron haematoxylin.
21. A primary spermatocyte showing a typical leptotene nucleus. The secondary nucleolus has disappeared. 20×100 . Bouin and Iron haematoxylin.

PLATE III.

22. A primary spermatocyte showing the ends of the zygotene threads embedded in the primary nucleolus. 20×100 . Bouin and Iron haematoxylin.
23. A primary spermatocyte showing the moniliform pachytene threads within the nucleus. 20×100 . Bouin and Iron haematoxylin.
24. A primary spermatocyte showing the nucleus in the diplotene stage. 20×100 . Bouin and Iron haematoxylin.
25. A primary spermatocyte with the Golgi forming a crescentic mass applied to the nuclear wall and mitochondria more or less concentrated at this pole of the cell. 20×100 . Nassanow.
26. Late anaphase of a primary spermatocyte showing the distribution of the cytoplasmic elements. 20×100 . Nassanow.
27. Anaphase polar view showing the ringlike arrangement of the thirteen chromosomes. 20×100 . Bouin and Iron haematoxylin.

PLATE IV.

28. Late anaphase of secondary spermatocyte showing the distribution of the cytoplasmic components. 20×100 . Nassanow.
29. Spermatid. The centrosome is distinct. 20×100 . Bouin and Iron haematoxylin.
30. Transforming spermatid showing the flask-shaped nuclear chromatin. The axial filament is formed. 20×100 . Bouin and Iron haematoxylin.
31. Transforming spermatid. Later stage. 20×100 . Bouin and Iron haematoxylin.
32. Transforming spermatid. The nucleus has elongated considerably and the nuclear wall forms a loose jacket to the nucleus. 20×100 . Bouin and Iron haematoxylin.
33. Spermatid showing the Golgi mass secreting the acrosomal vesicle and the scattered mitochondrial granules. 20×100 . Champy and Iron haematoxylin.

SPERMATOGENESIS OF CHILOSCYLLIUM GRISEUM 261

34. Transforming spermatid. The acrosome is deposited at the anterior end of the nucleus and the Golgi remnant is proceeding backwards. 20×100 . Nassanow.
35. A very elongated spermatid. The nucleus presents a homogeneous appearance. The ring-like border of the distal centrosome has become distinct and the axial filament has extended further. Diagrammatic. Champy and Iron haematoxylin.
36. Anterior part of an almost mature sperm. The nucleus presents a wavy appearance. The middle piece and tail are formed. The acrosome is distinct. Diagrammatic. Bouin and Iron haematoxylin.
37. Anterior part of a mature sperm exhibiting the spiral nature of the acrosome, head and middle piece. Diagrammatic. Bouin and Iron haematoxylin.



EXPLANATION OF PHOTOMICROGRAPHS

PLATE V.

1. Section of a young gonad showing the migration of the germinal epithelial cells through the fibrous layer towards the central mass of cells.
2. Section of a young gonad showing encystment of primary spermatogonium within follicle cells.
3. Section of testis showing the granular and elongated inclusions in the cells of the stroma.
4. Section of the postero-ventral region of testis showing the streaming in of the stromal cells in this region.
5. Section of the antero-dorsal region of testis to show the tissue of large cells in this region.
6. Section of testis to show the arrangement of primary spermatocytes in cysts.

PLATE VI.

7. Primary spermatocytes showing the presence of primary and secondary nucleoli.
8. Primary spermatocytes showing pachytene nuclei.
9. Primary spermatocytes showing synizetic nuclei.
10. Primary spermatocytes showing the crescentic mass of Golgi applied to the nucleus.
11. Polar views of early anaphase stages of primary spermatocytes showing the ring-like arrangement of the chromosomes.
12. A whole cyst of secondary spermatocytes in division. The cells are arranged within the cyst in 5 or 6 tiers.

PLATE VII.

13. Polar views of anaphase stages of secondary spermatocytes showing the ring-like arrangement of the chromosomes.
14. Transforming spermatids showing the flask-shaped arrangement of the chromatin within the nuclei. The vacuoles at the sides of the neck are distinct.
15. Transforming spermatids showing the formation of the axial filament. The funnel-like distal centrosome is distinct.
16. Transforming spermatids showing the pyriform appearance of the nucleus. The acrosome is distinct in some spermatids.
17. Young spermatids showing the presence of acroblasts within secreting the acrosomal vesicles.
18. Part of cyst showing the presence of the elongated bodies in between the sperm bundles.

KEY TO LETTERING

<i>a.</i>	:	acrosome.
<i>a.f.</i>	:	axial filament.
<i>a.v.</i>	:	acrosomal vesicle.
<i>ac.</i>	:	acroblast.
<i>b.v.</i>	:	blood vessel.
<i>c.</i>	:	centrosome.
<i>c.p.sc.</i>	:	cysts of primary spermatocytes.
<i>ch.</i>	:	chromosome.
<i>ch.r.</i>	:	chromosomal ring.
<i>d.c.</i>	:	distal centrosome.
<i>e.i.</i>	:	elongated inclusions in stromal cells.
<i>e.b.</i>	:	elongated body.
<i>f.c.</i>	:	follicle cell.
<i>f.l.</i>	:	fibrous layer of testis.
<i>g.b.</i>	:	Golgi body.
<i>g.c.</i>	:	Golgi crescent.
<i>g.ep.</i>	:	germinal epithelium.
<i>g.i.</i>	:	granular inclusions in stromal cells.
<i>g.re.</i>	:	Golgi remnant.
<i>h.</i>	:	head.
<i>m.c.</i>	:	mitochondrial cap.
<i>m.g.</i>	:	mitochondrial granule.
<i>m.p.</i>	:	middle piece.
<i>ma.p.</i>	:	main piece.
<i>m.s.</i>	:	mitochondrial sheath.
<i>n.</i>	:	nucleus.
<i>n.v.</i>	:	nuclear vacuole.
<i>n.w.</i>	:	nuclear wall.
<i>nu.</i>	:	nucleolus.
<i>p.c.</i>	:	proximal centrosome.
<i>p.n.</i>	:	polymorphic nucleus.
<i>p.nu.</i>	:	primary nucleolus.
<i>p.sg.</i>	:	primary spermatogonium.
<i>p.th.</i>	:	pachytene thread.
<i>py.n.</i>	:	pyriform nucleus.
<i>s.n.</i>	:	spherical nucleus.
<i>s.nu.</i>	:	secondary nucleolus.
<i>sp.c.</i>	:	spent cyst.
<i>st.</i>	:	stroma.
<i>syn.</i>	:	synizetic nucleus.
<i>t.</i>	:	tail.
<i>ti.</i>	:	tissue at antero-dorsal region of testis.

THE THEORY OF TWO KÖPPERUÑJINGAS

By

S. R. BALASUBRAHMANYAN

Chidambaram.

Mr. V. Venkatasubba Aiyar has re-examined this question in the last issue of the *Journal of the Madras University* (Vol. XIII, No. 1) and makes the confident assertion that “the Periyadevar evidence supported by the Chidambaram inscription is conclusive, and that the rule of the two Kōpperuñjīngas may hereafter be taken as well established.” It will be clear from the sequel that the claim made is not sustainable.

I have discussed the main problem in my thesis (Vol. IX, No. 3 and Vol. X, No. 1) and the full implications of the Villiyanur record in a later issue (Vol. XII, No. 2) and I do not propose to cover the ground over again. My valid objections to the acceptance of two chiefs of the same name have received scant justice at the hands of my friend when he brushes them aside as ‘other minor arguments’ unnecessary to be considered, because he claims to have got at a conclusive proof to support his position, viz., what he calls the ‘Periyadevar evidence’ in relation to the three Chidambaram records (465 of 1902, 467 of 1902 and 103 of 1934-35).

His interpretation of these three records is different from mine. He first allowed a regnal period of 11 years to the so-called first chief, and he has now extended it to 16 years. A new co-regency theory has been postulated, and he has been further driven to the inconvenient fact that “the elder chief was also known as Kōpperuñjīnga, and that he had the title of Sakalabhuvana-Cakravartin.”

It is clear—and it has also been conceded—that all these three records give the same name and titles to the ruler (Sakalabhuvana Cakravartigaḷ Avani Ālappirandan Kōpperuñjīnga); all mention his title of *Śōkkaccīyan*; and all refer to his feudatory *Śōlakōn*. Therefore all these three records should be attributed to one King. While Mr. V. Venkatasubba Aiyar grants the premises, he denies the inescapable conclusion.

The term Periyadevar is a term of respect generally applied by a ruling chief to his predecessor. But in the documents of this chief, the terms '*devar*', *Periyadevar* and *Aiyadevar* (Munnūr record 62 of 1919) are used by the feudatories to the reigning monarch. *Śōlakōn* refers to the King as *devar* or *Periyadevar*.

Further Mr. V. Venkatasubba Aiyar has made a mistake in assuming that there was only one garden called '*Śokkaccīyan-Kamugu-tirunandavanam*' that is referred to in all these three documents under discussion and that is why he says, "This *Śokkaccīyan-Kamugu-tirunandavanam* referred to above which is definitely known to have been formed in the 15th year of *Periyadevar* (*Kōpperuñjīnga* I) is again mentioned in a 3rd year record (A. R. No. 465 of 1902) of *Sakalabhuvana Cakravartin Kōpperuñjingadeva* who must be identical with *Kōpperuñjīnga* II."

The *Śokkaccīyan*-garden referred to in the 3rd year (81st day) record—485 of 1902—is different from the other garden of the same name referred to in both the other records of the 15th and 19th years. The former was at *Vikramasingapuram* and the latter at *Sundara-Śōlanallur* in *Vēśalippāḍipparru*. The mistake has arisen by assuming these two gardens to be one and the same.

The 3rd year record (465 of 1902) makes a gift for a flower garden called *Āliyār-tiruttoppu* (based on another surname of *Kōpperuñjīnga*) at *Vikramasingapuram*; and food and clothing for its gardeners are provided at the same rates as those of the '*Śokkaccīyan-Kamugu-tirunandavanam*'—evidently another garden just previously established in that very same village.

In the 15th year 262 day (grant finally engraved in the 16th year 262nd day) a grant of nearly 310 *mā*'s of land is made towards the formation of a flower-garden called '*Śokkaccīyan-Kamugu-tirunandavanam*' in *Sundara Śōlanallur* in *Vēśalippāḍipparru* (467 of 1902). The grant is made up of two parts—one of 63 and odd *mā*'s of land for the garden proper and another of 247 and odd *mā*'s for the maintenance of the gardeners (*Jīvitam*).

To the same garden at *Sundara Śōlanallur*, in *Vēśalippāḍipparru* (referred to in 467 of 1902), a further endowment of 80 *mā*'s of land (consisting of 63 *mā*'s and odd + 16 and odd of excess-measurement) with benefits of remission of rent is made and this new grant of the 19th year (103 of 1934-35) was ordered to be

engraved on the same wall on which 'the previous grant of the 15th year of Periyadevar' had been engraved.

Mr. V. Venkatasubba Aiyar admits that "fortunately the very same 15th year record is found on the identical wall indicated above (A.R. 467 of 1902). It refers to the same garden." I agree. But I wish to add that the term Periyadevar used here clearly applies to the same king. In that case it is wrong to attribute the 15th year recorded to Kōpperuñjiṅga I, and the 19th and 3rd year records to Kōpperuñjiṅga II. Hence I hold that these three records belong only to *one chief*. And therefore the new structure, built on the foundation of what is claimed to be definite and indisputable evidence, on which sole reliance is now placed, simply collapses. Therefore this latest theory also is not maintainable.



UNIVERSITY NOTES

His Excellency Sir Arthur Hope, G.C.I.E., M.C., who assumed the office of Governor of the Presidency of Madras on the 12th March 1940 became the Chancellor of the University and continued to be so during the year.

As there was no Minister for Education, the office of Pro-Chancellor of the University was vacant.

Sir Mahomed Usman, K.C.I.E., B.A., M.L.C., continued as Vice-Chancellor.

Mr. William McLean, M.B.E., J.P., M.A., B.L., Chartered Secretary, continued as Registrar.

AUTHORITIES AND MEETINGS

Three meetings of the Senate and two meetings of the Academic Council were held during the year. A special meeting of the Senate was held on the 8th August 1940 convened under Statute 7(2) of Chapter XI of the Laws of the University to consider a resolution urging on the Government the imperative necessity of imparting compulsory military training in all arms to all men students and nurses' training to all women students undergoing any course of study in the University. The resolution was adopted and forwarded to Government for favourable consideration.

The Faculties of Arts, Science and Oriental Learning each met once during the year. There were ten ordinary meetings and four special meetings of the Syndicate.

Meetings of the Convocation for conferring degrees on Graduates were held on the 15th February, 9th and 10th August 1940, respectively. At the main convocation held on the 9th August 1940, His Excellency, the Chancellor presided and the Address to Graduates was delivered by Sir R. K. Shunmukham Chetti, K.C.I.E., B.A., B.L., Diwan of Cochin. The Vice-Chancellor presided over the Convocations held on the 15th February 1940 and 10th August 1940, respectively.

The number of persons that took the several Degrees at the Convocations was :—B.A.—1152 ; B.A. (Hons.)—157 ; M.A.—

100; B.Sc.—221; B.Sc., (Hons.)—44; M.Sc.—12; B.Sc.—4; B.L.—210; M.L.—3; M.B.B.S.—98; L.M.S.—1; M.D.—2; M.S.—2; B.S.Sc.—2; B.E.—61; L.T.—329; B.Sc. (Ag.)—26; B.O.L.—15; B.V.Sc.—8; M.Litt.—2; M.O.L.—1.

There was a special meeting of the Senate on the 18th October 1940 for the award of Titles and Diplomas to persons who had qualified for the same. The number of persons who took the several titles and diplomas at the special meeting of the Senate was :—Siromani—47; Vidwan—103; Munshi-i-Fazil—14; Afzal-ul-Ulama—7; Adib-i-Fazil—15; Diploma in Economics—3; Diplomas in French and in German—11; Diploma in Gynaecology and Obstetrics—8; Diploma in Geography—9; Diploma in Indian Music—5; Diploma in Politics and Public Administration—6; and Diploma in Librarianship—1.

Certain additions and alterations were made in the course of the year in the Statutes, Ordinances and Regulations. One set of these empowers the Syndicate to grant such exemption as may be necessary in the case of students overseas who had to cease their studies and return to India, or others in India who had been prevented from joining a University in Great Britain owing to the outbreak of hostilities, for the purpose of admission to the courses of studies in this University.

CONSTITUENT AND AFFILIATED INSTITUTIONS

The following Institutions were granted recognition, affiliation or approval as the case might be in the subjects noted against each to commence the courses with effect from the academic year 1941-42 :—

- (1) Pachaiyappa's College, Madras.—(a) Botany and Zoology; Subsidiary under Part II of the B.Sc. Degree Course.—
(b) Group (iv-C).
Politics and History under Part III of the B.A. Degree Course.
- (2) Queen Mary's College, Madras.—Group (vii)—Geography under Part III of the B.A. Degree Course;
- (3) Sarah Tucker College, Palamcottah.—Group (i-b)—Mathematics under Part III of the B.A. Degree Course.
- (4) Madras Christian College, Tambaram.—(a) B.A. (Hons.) Branch IV—Economics and History.—(b) Group (iv-c) Politics and History under Part III of the B.A. Degree Course.

- (5) M. D. T. H. Hindu College, Tinnevely—(a) Natural Science under Part III of the Intermediate Course.—
(b) Group (iv-C).

Politics and History under Part III of the B.A. Degree Course.

- (6) Malabar Christian College, Calicut—Natural Science under Part III of the Intermediate Course.

- (7) Missionary Medical College for Women, Vellore.—Pre-Registration and First M.B.B.S. Course.

NOTE:—The Management have stated that the courses would be started from the next academic year 1942-43.

- (8) Stanley Medical College, Madras.—Second and Final M.B.B.S. Courses.

- (9) National College, Trichinopoly.—Group (iv-C)—Politics and History under Part III of the B.A. Degree Course.

ITEMS OF GENERAL AND ACADEMIC IMPORTANCE

*Teaching of Sanskrit and other Indian Languages:—*The Syndicate approved the recommendations of the Special Committee that (1) holders of the B.O.L. Degree should be paid the same scale of pay as allowed to Lecturers and Assistant Lecturers in other Departments of the colleges and (2) the scales of pay of Vidvans, Siromanis and other Oriental Title holders should be approximated to the scale in Government Colleges and that such persons should be designated as Assistant Lecturers in the Languages Departments and not as Pandits and Munshis. The Principals of the Colleges were addressed on the above and while some of them approved the recommendation, the management of Government Colleges was not in favour of changing the designation.

*Physical Education—Degree or Diploma Course:—*As reported last year, the provision of a Diploma Course in Physical Education in place of a Degree Course was considered by the Board of Studies in Teaching whose opinion was not approved by the Syndicate. The matter was finally referred to a Special Committee which was of the opinion that no useful purpose would be served by the University instituting a Degree Course in Physical Education or making Physical Education a separate branch of study in the L.T. Degree Course. Regarding institution of a

Diploma Course the Academic Council did not express any opinion.

*New Diploma Courses:—*The question of institution of a Diploma Course in Ophthalmology (D.O.), proposed by the Surgeon-General with the Government of Madras has been referred to the Board of Studies in Medicine for consideration. Regulations were framed for the Diploma Course in Statistics and the course will be started from the academic year 1941-42.

*Institution of New Departments:—*The resolution of the Senate regarding the institution of University Departments of Study and Research in Physics, Experimental Psychology, Anthropology and Statistics was considered by the Syndicate in the light of the recommendation of the Special Committee appointed by the Syndicate to consider the question of effecting economies in expenditure in the University and it was resolved that in view of the present international situation the proposals be deferred *sine die*.

*Military Science as a subject of study for the B.A. and B.Sc. Degree Courses:—*The Syndicate has reported to the Senate in October 1940 that owing to the war it is not possible to do anything in the matter of making Military Science a subject of study.

*Organisation of University Settlements:—*The resolution adopted by the Senate in October 1940 that University settlements should be organised so as to bring College and University students into contact with the peasants and workers and make economic surveys in order to improve their status and impart literacy to them was communicated to the Principals of Colleges for their opinion. The matter is still under consideration.

*Selection of Candidates for the Indian Air Force and the Madras Sappers and Miners:—*In July 1940 the Air Officer, Commanding the Air Forces in India, New Delhi, addressed the University to recommend candidates for selection to Commissions and in the ranks of the Indian Air Force. The Vice-Chancellor and the Registrar formed a Committee and forwarded to the Air Force Headquarters batches of names of candidates interviewed and selected. With regard to clerical posts the names of persons registered in the University Employment Bureau was furnished to the Officer concerned.

The Officer Commanding, Queen Victoria's Own Madras Sappers and Miners, suggested that the Vice-Chancellor and the

Registrar might recommend names of persons from among students in colleges and others for selection to the Madras Sappers and Miners. A press communique was issued and two hundred applicants were interviewed in six batches and 89 persons were recommended.

TEACHERS AND RESEARCH DEPARTMENTS

Mr. V. Kalyanasundaram, M.A., was appointed Junior Lecturer in Geography in place of Mr. B. M. Tirunaranan, B.A., (Hons.), who resigned the post on being appointed to the Madras Educational Service.

Mr. M. Mariappa Bhat, M.A., L.T., was appointed Senior Lecturer in Kannada on the 14th September 1940.

Mr. B. Bhaktavatsulu Naidu, B.A., G.D.A., R.A., was appointed special part-time Lecturer in Commerce-Accountancy and Cost Accounting for the Diploma Course in Politics and Public Administration.

Mr. E. Divien, B.A. (Hons.), and Mrs. Ellen Sharma, M.A., M.Ed., continued as Lecturers (part-time) for the Diploma Courses in French and German respectively.

The services of Dr. P. J. Thomas, Professor of Indian Economics have been temporarily lent as he was appointed as Chairman of the Fact-Finding Committee (Handloom and Mills). As a result of this, Dr. P. S. Lokanathan and Mr. K. C. Ramakrishnan were appointed as Acting Professor and Reader respectively. Mr. B. Natarajan was appointed temporarily as Lecturer in the Department.

The Professor of Indian History and Archaeology, the Reader in Politics and Public Administration, the Reader in Indian Philosophy, the Directors of Biochemistry and Botany Laboratories delivered lectures to Honours students in Constituent Colleges in the respective special subjects under the scheme of association of teachers of the University with Honours teaching in the colleges.

Mr. S. Chandrasekharan, a Research student in Economics was awarded a foreign scholarship for one year at Rs. 60 per mensem tenable in the Columbia University, U.S.A., for advanced investigation on Mathematical Economics.

The Syndicate sanctioned the appointment of three Research Assistants for work on the Mackenzie Manuscripts. Indexing of the Puranas and Topology.

PUBLICATIONS

The following works of the members of Research Departments of the University were published during the year:—

Books.

<i>Name of the work.</i>	<i>Author.</i>	<i>Department.</i>
Ezhuthaccan and His Age	Dr. C. Achyuta Menon	Malayalam
Oshadi Kosham	Messrs. A. Venkata Rao and H. Sesha Ayyangar	Kannada
Abhidhanaratnamala	Do.	Do.
Prakatarthavivaranam, Part II	Dr. T. R. Chintamani	Sanskrit
Slokavartika	Mr. S. K. Ramanatha Sastri	Do.

Bulletins

<i>Name of the work.</i>	<i>Author.</i>	<i>Department.</i>
Commodity Prices in South India	Dr. P. J. Thomas and Mr. N. Sundararama Sastri	Economics.

Besides the above, the Endowment Lectures delivered by Dr. D. R. Bhandarkar (Sir William Meyer Lectureship—1938-39), Professor P. Narasimham (Principal Miller Lectureship—1939-40), the Rev. P. Carty, s.j., (Sir William Meyer Lectureship—1939-40) and Dr. A. Govinda Rao (Sir Subramanya Ayyar Lectureship—1938-39) were also published.

The preparation of a concise Tamil Dictionary based on the Tamil Lexicon was taken up and the work entrusted to a private firm.

Lectures:—The annual lectures by the Heads of the Departments of the University and the Lectures by the Honorary Readers in their respective subjects were as usual delivered in the year under review.

Extension Lectures—were delivered at Madras, Trichy, Madura, Coimbatore, Ernakulam and Mangalore.

Endowment Lectures:—The following lectures under the several Endowments were delivered :—

<i>Name of the Endowment.</i>	<i>Name of the Lecturer.</i>	<i>Subject of Lectures.</i>
The Maharaja of Travancore Curzon Lecture-ship-Medicine-clinical.	Dr. N. Mangesh Rao	Urinary Lithiasis.
do. Engineering	Rao Bahadur N. Govindaraja Ayyangar	Highway Bridges.
do. Agriculture	Dr. M. Damodaran	Nitrogen metabolism and the feeding of crops and stock.
The Sankara Parvathi Lectureship.	Sri V. R. Ramachandra Dikshitar.	Tamil Culture
The Sir Subrahmanya Ayyar Lectureship.	Dr. M. O. Parthasarathi Ayyangar.	Problems of Fresh Water Microscopic Plant Biology.
The Sir William Meyer Lectureship	Dr. Radhakumudherji	Muk-Chandragupta Maurya and his times.
The Principal Miller Lectureship.	Sri M. Hiriyantha	The quest after perfection.
The Dr. Elizabeth Matthai Lectureship.	Dr. P. Kutumbayya	Rheumatic infection in childhood and adolescence.
The Rt. Hon. V. S. Srinivasa Sastri Lectureship.	Sir Shaafat Ahmed Khan.	The framing of the Indian Constitution
The Rt. Hon. Sir George Stanley Lectureship.	Humayun Z. A. Kabir.	Poetry and Social Integrity. Back to intuition—Wordsworth and Lawrence. The Modern Quest—Yeats and Eliot.
The Dr. Annie Besant Memorial Lectureship.	Sir P. S. Sivaswami Ayyar	Ahimsa and Asanga.

Vacation Lectures:—A course of vacation lectures for the benefit of workers engaged in Adult Education and Rural Amelioration was delivered by the Rev. H. A. Popley, Messrs. A. J. de Valois, R. Suryanarayana Rao, and F. Malthus Smith at Coim-

batore, Chittoor and Madura, Coimbatore and Madura, and Saidapet and Anantapur, respectively.

The Syndicate, on the recommendation of the Boards of Examiners has awarded the prizes for the encouragement of publication of works on modern subjects in the Dravidian Languages to (1) Messrs. J. P. Manikkam, M.A., and P. N. Appuswami, B.A., B.L., (joint authors) for their work on "Radio and Broadcasting" in Tamil and to (2) Mr. B. Natarajan, M.A., for his work on "Industrial Development" in Tamil.

University Library:—The total number of volumes in the Library is 112216 of which 92576 are in the Main Library and the remaining 19640 are in the Departmental Libraries. 2666 volumes were added during the year.

The printing of the Library Catalogue was continued and the following volumes have been published:—

Supplement Catalogues for 1939 (282 pages).

Botany, Agriculture and Forestry (240 pages).

2768 volumes have been catalogued during the year involving the preparation of 6561 cards. The departmental libraries have been centralised in the northern and southern wings of the University Buildings (first floor), under the charge of an Honorary Librarian (Mr. V. R. Ramachandra Dikshitar).

University Information Bureau:—Due to the War, there were few enquiries from students regarding prosecution of studies overseas. More enquiries regarding courses of studies in Indian Universities than in foreign Universities were made and the Bureau did its best to furnish every kind of information available.

University Union:—The Union continued to provide recreative facilities to the students of the colleges. The establishment of the Union was made permanent. The Pavilion for the Union was completed in September 1940.

Endowments:—No new endowments were made this year. The terms of award of several endowments were revised to suit the existing conditions.

Conferences and Congresses:—The Indian Philosophical Congress was held in Madras in December 1940 under the auspi-

ces of the University. Delegates were also sent to represent the University at the following Conferences and Congresses during the year :—

1. The Bicentennial Celebration of the University of Pennsylvania, Sept. 1940.
2. The 17th Session of the Indian Historical Records Commission at Baroda, December 1940.
3. The 4th Session of the Indian Historical Congress at Lahore, Dec. 1940.
4. The 29th Session of the Hindi Sahitya Sammelan at Poona, Dec. 1940.
5. The 8th All-India Music Conference at Allahabad, November 1940.
6. The 28th Session of the Indian Science Congress at Benares, Jan. 1941.
7. The Indian Economic Conference at Mysore, Dec. 1940.
8. The Indian Political Science Conference at Mysore, December 1940.



REVIEWS

BHAGAVADGĪTĀRTHAPRAKĀŚIKĀ by Upaniṣad-Brahma-Yogin, edited with the text ; published by Adyar Library, 1941; pp. xxxix+457.

The Adyar Library has rendered valuable service to Sanskrit philosophical literature by the publication of the upaniṣads with the not voluminous but illuminating commentaries of Upaniṣad-Brahma-Yogin. The present volume marks a notable and worthy addition to those publications. The *Gītā* commentary is short and lucid, following the general lines of Advaita tradition. The commentary on each chapter is introduced by a verse giving very briefly the purport of that chapter. Occasionally the commentator gives us samples of his own learning and originality as when he suggests three etymological interpretations of "Janaka" (III, 20). Both scholars and beginners will find that the commentary provides interesting reading. Dr. C. Kunhan Raja, Curator of the Eastern Section of the Library, has provided a valuable preface where he discusses many attempts to discover an original *Gita*, either fuller or far shorter than the current text of 700 verses. Dr. Raja's attitude is wisely conservative; the present text comes to us with the sanction of all three ācāryas and cannot be questioned, especially when no better basis is provided for the questioning than undocumented texts, airy conjectures, apocryphal enumerations and free fancies as to how much could or could not have taken place in a battle-field. The reader cannot help agreeing for the most part with Dr. Raja, though he may continue to feel sceptical and unhappy about what is called the "direct teaching of the Lord." We trust the Adyar Library will continue its service to scholarship and bring out many more such volumes.

THE THEORY OF PROPER NAMES. By Alan H. Gardiner, F.B.A.; Oxford University Press, pp. 67. Price 5sh. net; 1940.

In this highly interesting, but "controversial essay," Mr. Gardiner starts with Mill's characterisation of proper names as "meaningless marks" and proceeds to substantiate it, showing how a name properly so-called has the sole function of *identification* (not description or distinction) and how this function is dis-

charged by the word as pure word without any or almost without any reference to meaning. The conditions of the use of proper names are (1) the existence of a plurality of sufficiently similar things, and (2) existence of interest sufficient to call for the identification of one out of this group, and (3) the application of a word, with the recognition that it is almost pure sound, serving to identify that individual or thing. There are incidental discussions about collective proper names (e.g., *Parliament*), plural proper names (e.g., *Azores*), proper names primarily in the plural, but serving as the basis for a derived singular (e.g., a *Mede* or a *Persian*) and so on. Mr. Gardiner's thesis deserves close examination, even if it does not command ready assent. Some Indian readers will be tempted to subscribe at once to his view that every name implies a nameable, at least as presented to the mind, but not as necessarily real. They may also see much value in the distinction between identification and description (or predication). But this doctrine on the borderland between Logic and Grammar will have to be developed more fully in its logical and ontological implications before it can be finally accepted or rejected. The Russell-Stebbing view of proper names as names for particulars, as exemplified in "this" or "that" comes in for some seven pages of criticism; we can only observe that the view is so erratic as hardly to deserve Mr. Gardiner's powder and shot.

THE TRAVANCORE TRIBES AND CASTES, Vol. III. The Aborigines of Travancore; By L. A. Krishna Aiyer, M.A., Trivandrum, 1941.

This compact and neatly printed volume completes the survey undertaken by Mr. L. A. Krishna Aiyer of the Tribes and Castes representing the Proto-Australoid element in Travancore, and presents the general conclusion of the author on these aboriginal peoples of Travancore. The data presented in the earlier volumes under each tribe are now reviewed against the background of current theories of ethnologists and grouped under convenient heads like Traditions of Origin, Megalithic monuments, Domestic Life, Exogamy, Marriage, Taboo and so on. The author deserves to be congratulated on the moderation and sobriety of his views and his clear and compact statement of them. He has made some useful suggestions on the policy of the State towards these tribes which will doubtless, one hopes, receive attention at the

hands of the Travancore Government that have initiated this survey so instructive to students of ethnology and administrators alike.

K. A. N.

THE RELIGIOUS POLICY OF THE MUGHAL EMPERORS.

By Sri Ram Sharma. Published by Humphrey Milford, Oxford University, Press, 1940 ; pp. 226. Price Rs. 5.

Professor Sri Ram Sharma of D. A. V. College, Lahore, is a Persian scholar of repute and a historian whose work is characterised by great erudition and sound judgment. In the book before us Professor Sharma has given a succinct account of the religious policy of the Mughal emperors. The book stops with the death of Aurangzeb and the main outlines of the story retain the familiar features. Akbar's great attempt to unify India is put in a correct perspective in the light of what went before him and what came after. With Aurangzeb, according to the author, there was a definite reversion to the Muslim state of pre-Akbar days whose code was hostile to the people of the country, and which was therefore more a military camp established in a hostile country than a state in any proper sense of the term. Professor Sharma establishes his thesis by a formidable array of facts and cites chapter and verse largely from Muslim historians for every fact which he admits into his narrative. Students of Indian history will be deeply grateful to Professor Sharma for this succinct and authoritative account of one of the most important aspects of Mughal Indian history.

K. A. N.

THE PARAMĀRTHASĀRA OF ĀDI ŚEṢA (transliterated text, English translation and notes). Edited By S. S. Suryanarayana Sastri, Head of the Department of Indian Philosophy, University of Madras, and published by the Karnatak Publishing House, Bombay, 1941. Pp. xxi, 40. Price : Rs. 4.

Students of Indian Philosophy will welcome with eagerness the present edition of the Paramārthasāra of Ādi Śeṣa by Mr. S. S. Suryanarayana Sastri whose critical editions of Vedantic texts have earned a distinct place for themselves in Indian philosophical literature. The Paramārthasāra is a very early work belonging to a time when Kārikas began to replace Sūtras and the great Bhāṣyas had not yet come into existence. In his excellent intro-

duction to this edition, Mr. Suryanarayana Sastri rightly points out that we may consider the present work as representing the transition from Sāṅkhya to Advaita Vedānta and assigns it to some period before Advaita Vedānta was clearly and fully formulated. In the introduction he also discusses the central doctrines of the Paramārthasāra and their distinguishing traits, while in the elaborate notes which accompany the translation he draws attention to its affinities and divergences from Sāṅkhya teaching and of its uncertainties on some controversial points in the doctrines of Advaita characteristic of the very early stage of thought to which the work belongs. The translation, which, as usual with Mr. Sastri, is very correct and readable, draws upon the commentary of Rāghavānanda for indicating transitions of thought in the original text, the translation of the phrases so drawn being put within brackets. Particular attention may be invited to Mr. Sastri's attempt to identify the eighty-five verses of the original (p. xv) from which the work takes the name Āryāpañcāśīti.

We congratulate the author and the publishers of this excellent definitive edition of one of the earliest texts of Advaita Vedānta.

K. A. N.

BAJI RAO II, AND THE EAST INDIA COMPANY, 1796-1818.

By P. C. Gupta, published by Humphrey Milford, Oxford University Press, 1939. Pp. 219. Price Rs. 7.

The last Peshwa and the transactions of his time are no very inspiring subject, but a student in search of a relatively neglected field to furnish the ground for a Doctoral thesis has every reason to turn to this epoch. Dr. Gupta has produced an accurate and well studied survey of the transactions of the time of Baji Rao II and in particular his relations with the East India Company. The work treats of the period in considerable detail, is based on a fresh study of almost all important documents bearing on the period, and is very well written. Not to speak of minor corrections in dates and details that are found throughout the work, one point to which attention may be invited is the attempt of the author to fasten responsibility for the murder of Gangadhar Shastri on the anti-British party in Baroda rather than on the Peshwa as has so far been the rule (p. 141).

The book will take rank as a very authoritative account of the closing years of the Mahratta empire in India.

K. A. N.

STATISTICAL YEAR BOOK OF THE LEAGUE OF NATIONS
—1939-'40.

The Year Book gives "an international synopsis of available statistics relating to the most important demographies, economic, financial and social phenomena and includes as many countries as possible." Copious notes are attached to many of the tables explaining the scope and nature of the statistics. The Year Book improved in its scope and data published since its first appearance in 1927. But war had its own effects in this publication because most belligerent countries and certain neutral countries have forbidden the publication of economic data, in whole or in part. Hence some of the important tables relating to employment, production, hours of work and production of certain food products and others had to be curtailed. In spite of these omissions this book constitutes a very useful source for international comparisons, and great pains were taken in co-operation with national administrators and sister bodies like the International Institute of Agriculture, to obtain comparable and latest data possible. This is one of the useful products of the League of Nations, which though it failed completely in the political field, made several useful contributions in the social and economic fields. This volume is a very useful book for students of Economics who are interested in the studies of demography of population, agriculture and industrial production, transport and monetary statistics of the different parts of the Globe.

N. S. R.

THE VICEROY AND GOVERNOR-GENERAL OF INDIA. By
A. B. Rudra (Oxford University Press, 1940, price Rs. 10).

This book represents the thesis approved for the Degree of Doctor of Philosophy in the University of London. It has an appreciative foreword from Prof. H. J. Laski. Dr. Rudra has endeavoured in it to give a historical and analytical study of the position of the Viceroy and Governor-General in the constitutional structure of India. "The Viceroy as such has no statutory recognition nor has he any statutory or delegated powers. The term gives the Governor-General the status of the personal representative of the King but even without the use of this word the Governor-General may be as fully the personal representative of the King as with its use.....Under the new constitution however, the term Viceroy has one important significance: while the single term 'Governor-General' or 'Crown Representative'

does not cover the dual capacities of the King's representative in India, the term 'Viceroy' does." As Viceroy he is the head of the Indian Federation, Crown's agent for the exercise of Paramountcy, and the agent of the British Government and hence of the British Parliament.

The book is divided into two parts. The first part is a study of the appointment and tenure of the Governor-General, his social and legal status and his powers under the Montagu-Chelmsford Reforms. Here are also examined the Departments of the Government of India, their organisation and secretariat procedure. Two sections are devoted to a description of the Executive Council, its functions and its relation to the Governor-General. This is followed by two sections on the Government of India and the Secretary of State for India. The Secretary of State in Council was a corporate body. Its composition changed from time to time. Notwithstanding the Act of 1919 the control of the India Office over the Government of India had been practically all-embracing. But the Act of 1935 has altered the legal position of the Secretary of State *vis-a-vis* the Government in India. The author shares the Indian public opinion that the less the interference of the Secretary of State the better will it be for both India and England. In addition to his rights and powers, the Governor-General enjoys certain extraordinary powers—disallowing the adjournment motions, legislation by certification and also by ordinance.

In part II the position of the Governor-General under the Act of 1935 is explained with the same accuracy to details, in spite of the fact that the Act is a complicated statute. The Act aimed above all at four things: All India Federation, Central Responsibility, Provincial Autonomy and Safeguards. While some departments will be under the direct control of the Governor-General, the rest of the Federal Departments will be in charge of Ministers, subject to the Governor-General's power of intervention. He continues to have positive power of legislation by ordinance and by Act. Dr. Rudra goes on to examine the position of the Governor-General in the Federal Executive. After a thoroughgoing examination of the constitutional structure it is concluded thus: "The constitution is one which has proved unacceptable to instructed political opinion in India. The safeguards are frankly irritating and not necessarily in the interests of India."

There are four appendices, two of them being Letters Patent constituting the office of the Governor-General of India and also the office of the Crown Representative. One appendix is the draft

Instrument of Instructions to the Governor-General. As one surveys the different chapters of the book, one sees that Dr. Rudra's study is very comprehensive, and the treatment of the subject judicious. Whenever he treads on a controversial field, he offers many a helpful criticism. His is a facile pen that makes his readers sustain unabated interest in the subject.

V. R. R. Dikshitar.

OXFORD PAMPHLETS ON WORLD AFFAIRS.

No. 36—*The Gestapo* by O. C. Giles.—Mr. Giles is an English barrister who has made a special study of Nazi Germany. He gives a very clear, valuable and dispassionate account of the origin and growth of the secret police, showing how it marks not a reversion to a state of suspension of civil right because of a state of emergency, but the growth of a new notion, that of National Socialist feudalism. Because of the growth of this notion, police control has passed from the constituent states to the Reich; the sphere of control has extended from public acts to almost the entire life of every citizen; in practice and largely even in theory the political police and even the ordinary police, when functioning as its auxiliary has become independent of judicial control; and by a queer distortion of principle Germany claims the right to punish through the Gestapo even crimes committed in foreign countries by German political!

No. 37—*War and Treaties* by Arnold D. McNair.—Political theorists of ancient India envisaged a circle of states consisting of friendly, enemy and neutral states which were bound by agreements and entente, the observance of which was something sacred and the non-observance something profane. If we take a long range view from the age long before the dawn of the Christian era down to the present day, we are disappointed to find any substantial improvement in the law and practice of treaties. If we only take into account the treatment given to these treaties between one state and the other during the last three years in Europe one has to say that the sanctity attached to them in former times is no more respected. This booklet endeavours to show this state of affairs in a detailed manner, especially Hitler's way with treaties. The author believes in the principle of the revision of treaties provided the parties agree to it, and that to be effected by peaceful means. Article 18 of the Covenant condemned secret treaty-making. If we want to minimise the war-risks, it could be done only

by honourable diplomacy and a keen sense of the standards of international morality. What is wanted is a courageous tackling of international law, by depriving it of its imperfections and immaturities in regard to treaties.

V. R. R.

No. 38—*Britain's Blockade* by R. W. B. Clarke.—Propaganda, diplomacy, blockade coupled with bombing of Industrial objectives calculated to intensify the effects of blockade, are the weapons by which Britain can hope to counteract the Nazi military power and weaken it from within. The Pamphlet was written in October 1940, and part of it, particularly the discussion of the position of neutrals in the blockaded region, is now antiquated. Otherwise we have a careful and balanced view of the position of the enemy under the blockade (which is pronounced to be effective) in the matter of vital supplies, oil, coal and coke, metals, textiles and leather, as also of the war-time economies in civil consumption and their effect in prolonging the struggle. The author finds 'no reason to suppose that a condition of starvation will develop (in Europe), or anything like it,' though the quality of the food may deteriorate owing to lack of meat, fats and so on; yet, 'it seems likely that by the end of 1941 the raw material blockade will be having serious effects upon the German and Italian productive systems.' Relaxation of blockade 'even for the most humanitarian purposes' without safeguards (which are not likely to be forthcoming) is deprecated, and the need for giving up static defensive strategy in favour of shrewd counter-attacks and pushes clearly demonstrated.

K. A. N.

No. 39—*South Africa* by E. A. Walker.—A succinct history of the Union and its racial problems. With the closure of the Mediterranean, South Africa has regained its former importance as the half-way house from Europe to India. The present war which threatened a political crisis at its outbreak may provide the common experience that will unite the Europeans of South Africa into one people, or conceivably, the fires still smouldering may be fanned into flame by the Nationalist followers of Dr. Malan, and even of Hertzog, listening to German war propaganda. Anti-semitism is also rising. The problem of the coloured races, native Bantu and Indian immigrant, is briefly stated, and their fate is frankly admitted to depend on the sweet will of the Whites who are by no means friendly to them.

K. A. N.

No. 41—*The Origins of the War by E. L. Woodward.*—This pamphlet seeks to explain the immediate and deeper causes that led to the outbreak of the present conflagration in Europe. The immediate cause was of course Hitler's demands on Poland, one for the return of Danzig to the Reich and secondly the grant of a wide zone across the Polish Corridor so as to construct a military road and railway. The Poles regarded these demands as an attack on their independence and rejected them. The Führer answered by an invasion. The British and French Governments warned Germany of their obligations to Poland and asked for the withdrawal of her troops from the Polish frontier. This was not to be. So the Allies went to war to aid the distressed Poles.

Though this was the prelude to the war still there were deeper causes ever since Hitler became Chancellor of the Reich. It began with Germany's withdrawal from the League of Nations in October 1933. She then proceeded to strengthen her military, naval and air arms. Great Britain continued to keep diplomatic negotiations with Germany and the latter voluntarily entered into the Locarno agreements only to denounce them soon. Germany and Italy after the outbreak of the Spanish Civil War in July 1936 increased their armaments and embarked on new methods of war. In 1938 Austria was annexed and then Czechoslovakia. National Socialism appealed to Germany while the danger to democracy and all that is noblest in Western civilisation became more and more prominent. The Allies were forced to enter the war to make the world safe for democracy.

V. R. R.

No. 42—*What Acts of War are justifiable? by A. L. Goodhart.*—The Professor of Jurisprudence at Oxford discusses what acts are or are not justifiable in a belligerent state's relations to non-combatants, combatants, and neutrals. The German misdeeds both in the last and in the present war are shown up in their true colours. The infringement of International Law is coupled with an attempt to show that there has been no violation; hence even the enemy implicitly admits the existence of such law. The blockade of Germany is not on a par with German frightfulness, since the Allies but seek to prevent the entry into Germany, of such material as is likely to be used for military purposes. One may agree with all this and still question whether the primary evil is not war, rather than the incidents here discussed. War at the present-day is not the pursuit of a *kula-dharma* by a lusty, fighting class, but the expression of earth-hunger masquerading under claims of *Kultur*,

Race, or *Lebensraum*. With such falsity at the core, it seems as idle to look for observance of International Law, as to justify the *right* to reprisal (p. 25). *Pace* Prof. Goodhart, one still tends to be a pessimist and hold that *modern* war knows no laws.

No. 43—*Latin America* by Robin A. Humphreys.—A well-studied account of the history of the S. American states with a stress on the role of England in favouring their liberation in the nineteenth century. The rapid economic growth of the States since the First World War, their attitude to the League of Nations, and their reactions to changes in the United States policy are clearly expounded; and incidentally the strength of the German element in these lands assessed. Geographical and economic data of great value are very impressively presented.

K. A. N.

ENGLISH TRANSLATION OF THE SAMANYA VEDANTA UPANISHADS by T. R. Srinivasa Aiyangar and S. Subrahmanya Sastri; Theosophical Publishing House, Adyar; pp. xxxvi+534, 1941.

Messrs. Srinivasa Aiyangar and Subrahmanya Sastri continue in the present volume the work of Upanishad translation which they started with the Yoga Upanishads. The work has been done with great care and thoroughness, following the commentary of Upanishad-Brahma-Yogin whenever the bare text has to be supplemented or interpreted. The sectional captions of the Adyar Library edition have also been translated, offering valuable help to the reader. In some cases, however, they fail to be sufficiently helpful; for instance, the heading given on p. 24, will hardly make it clear to the reader (as does the commentary) that in the *sidhānta* of this Upanishad, the continuance of *prārabdha* is discountenanced; and the reader's confusion is increased by a set of quotation marks (in the penultimate line) marking the end, but not the beginning of a particular passage. Again, *Nirvikalpa samādhi* (p. 17) is hardly 'misconceptionless trance'; and 'wealth of cattle' would have been a better rendering than 'bovine wealth' on p. 529. But as Mr. Srinivasa Aiyangar says (p. vii) "nothing is perfect in this phenomenal world of ours" and for what we have got we are really thankful to the translator and his editor. The get-up, as usual with the T.P.H. is excellent.

HISTORY OF THE KAMMAS—PART II by Kotta Bhavayya
Choudari of Sangam Jagarlamudi, Tenali Taluq, Guntur Dt.

Kammas are a sect of people belonging to the non-Brahmin community of the Telugu country. They are said to have derived their name from that part of the Telugu country namely 'Kamma-vāḍu' also called Kammarashtra or Karmarashtra comprising the Guntur and part of the Nellore District of the Madras Presidency, from having inhabited that country. This sect of people along with some others like Reddis, Kapus, etc., are mostly well-to-do people engaged in agriculture and are generally considered as an upper class among the various sects of that community. The chief purpose of Mr. Kotta Bhavayya Choudari in writing this history of Kamma people is not only to trace the genealogies of the individual families of this sect to earlier times but also to establish connection of many of those families with the various dynasties of kings who ruled over the Telugu country from times immemorial. In trying to do so he has laboured hard to gather information about the various dynasties of rulers of the Telugu country, and to identify the names of some villages and towns occurring in inscriptions granted by them and of which they are said to be the overlords, with the house names of the Kamma families obtaining in this country for some centuries.

Part I seems to have dealt with the history of the ruling dynasties of the country till the end of the 1st millinium after Christ. Part II, the present work, deals with the rulers of the later dynasties from the beginning of the 11th century A.D., like those of Chalukya, Durjaya, Chada and Haihaya and tries to trace the descent of some Kamma families from rulers belonging to those dynasties. Though it cannot be denied that a few later Kamma families might have descended from some of the old ruling families of that country particularly Karmarashtra, the method adopted by the author in tracing their descent from them does not seem to be quite satisfactory. One or two instances may be mentioned here. Vol. IV of S. I. I. is said to have recorded an inscription of Vengi Mahadevaraja perhaps the son of Velanati Gonka III wherein the former was mentioned as 'Siddhipuravaradhiswara'. The author tries to identify this 'Siddhipura' with some Suddhapalligrama, and to trace the family having the Suddhapalli as their house name, to the family of the Vengi King Velanati Gonka III. Inscription No. 1325 of Vol. IV S.I.I. is said to have mentioned that in the time of Kulottungachola, one Pendalapaka Bhimayya who was an 'adapa' i.e., betel-leaf-bag carrier, gave some

goats to the God for the merit of Vishnuvardhana Brahmadhiraya Tammayya. The word 'adapa' in this sentence is interpreted as governing the following word and construed to be the house name of the latter to which the later 'adapa' family has been traced. "Pandalapaka Bhimaya Zaina adapa Vishnuvardhana Brahmadhirayaru Tammayyakudharmarthambuga bettina goriyalu." In another place "elamanchi maharaju Lakkamadevi Kunturu Ambikadevi"—Elamanchi is taken as a house name, while 'elamanchi maharaju' evidently means the Ruler or the Lord of Elamanchi.

Though it must be said that the author has taken great pains in presenting in this work the history of some of the ruling dynasties of the Telugu country in some detail, we cannot be sure that he has everywhere succeeded in his attempt to trace the history of the families of Kamma sect to the ancient ruling dynasties of the country.

K. R.

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- Arthur Mee: *Higher Chemical Calculations*.
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Hannum and Brown: *Laboratory text in Elementary Zoology*.
Modern Verse, 1900-1940 (World's Classics) (O.U.P.).
Selections from Plato (World's Classics) (O.U.P.).
Diversions, An Anthology (O.U.P.).
Geoffrey Crowther: *Ways and Means of War* (O.U.P.).
Gibb, H. A. R.: *The Arabs* (O.U.P.).
The Madras Agricultural Journal, Vol. XXIX, Nos. 1, 2 and 5.
The New Review, Nos. 74, 75, 76, 77, 78 and 79.
Bulletin of the Deccan College Research Institute, Vol. II, Nos. 3-4 with appendix.
The Journal of the Literary Committee, Vol. I, No. 1.
Indian Journal of Venereal Diseases and Dermatology, Vol. 7, Nos. 1 and 2.
Adyar Library Bulletin, Vol. V, Pt. I.
The Zamorin's College Magazine (March 1941).
The Journal of the University of Bombay, Vol. IX, Part 5.

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THE QUEST AFTER PERFECTION

By

M. HIRIYANNA





THE QUEST AFTER PERFECTION*

LECTURE I

According to the terms of the endowment, these Lectures should deal with 'the inner meaning of human history'. This description of their subject-matter implies that there is some ultimate purpose which man as such continually pursues, but that he does so unknowingly or, at all events, without a complete consciousness of it. If it is such a distinctive feature of man to pursue this purpose, we shall be able to determine it, at least in a general way, by inquiring wherein he most differs from the rest of sentient creation. The difference lies, as is commonly recognised, in the fact that he can become self-conscious or explicitly aware of his own identity. While other animals also lead a conscious life, they never know that they do so. In the words of one of our scriptures,¹ they live only from moment to moment, whereas man is aware of the past as well as the future. It is a great gift, because it enables him to review his thoughts, feelings, and actions as if they were apart from himself and pass judgment upon them. This capacity for self-criticism necessarily points to an awareness of a standard by which he judges; and the standard can be nothing short of absolute perfection, for the simple reason that the need for criticism will continue to be felt until an ideal, which is free from all imperfections and is therefore completely satisfying, is reached. In fact, man would not feel that he was imperfect if he had not within him such an ideal, latent though it may be. Whether he will ever attain it or whether, in thinking he will, he is only chasing a will-o'-the-wisp is a question to which I shall advert later. For the present it will suffice to note the existence in his mind of this ideal, urging him to strive for reaching a state in which he may rest with a feeling of contentment.

It is the presence within him of this ideal of perfection that makes man a spiritual being. Though all people are alike prompted by it, a loyal response to its promptings is by no means easy, for man is also a natural being. That is, he is not only inspired by a

* The Principal Miller Lectures delivered on the 17th and 18th December, 1940, under the auspices of the University of Madras.

1. *Aitareya Āraṇyaka*, II.iii.2.

consciousness of what he *ought to be*; he is also what he *is*, which tends to keep him bound to the pursuit of lower ends. This double nature results in an internal conflict between the flesh and the spirit or, as they are otherwise termed, the lower and the higher selves; and only some can, by overcoming it, respond wholeheartedly to the bidding of the higher self. It is to their thought and labour that human progress is entirely due. Since, however, the ideal is not explicitly known, even they can aim at it only tentatively; and the ends, which they actually pursue, may fall far short of it. My object in to-day's lecture is to find out whether we can define the ideal better, by considering the scope and nature of these tentative ends. I shall select for consideration what are called the eternal values, viz. Goodness, Beauty and Truth which are typical of such ends. They are now often regarded as standing for the ultimate ideal itself; but, I hope, it will become clear as I proceed that it is not correct to do so and that in pursuing them, however praiseworthy the pursuit in itself may be, man is still groping about for his final goal.

(1) *Beauty*

To begin with the second of these three values, viz. beauty, and consider it in relation to art first. It is well known that the contemplation of a work of art leads to an attitude of mind which is quite impersonal. Man not only grows unselfish here, but also forgets himself completely; and in the supreme aesthetic moment, he is conscious of nothing but the object or the situation portrayed in the work of art in question. His attitude then resembles what the *yogins* term *savikalpaka-samādhi*, in which one loses oneself, as it were, in contemplative union with the object. As a consequence of this self-forgetfulness, man rises above all the cares and anxieties of everyday life and experiences a rare kind of satisfaction, such as characterises, according to what I have stated, the realisation of the ultimate ideal. Further, this satisfaction, as commonly construed, is, like the final ideal, sought for its own sake and not as a means to anything else. All this is true; yet art experience cannot serve as that ideal, for it has, at least, one great deficiency which renders it unfit to do so. The contemplative satisfaction which it signifies is transient, because it lasts only as long as the art stimulus lasts; and the stimulus is bound to end, sooner or later, since it arises from an external and fictitious situation created by the artist. It is not suggested by this, that art experience will not leave its wholesome influence behind. All that is meant is that, whatever may be the nature and extent of that influence, the experience

itself, with its distinctive features, disappears after a time. And no state that is transitory can obviously be regarded as the final goal of life, whatever its other excellences may be.

To turn now from art to nature: There is a view, put forward by some, that beauty has no meaning when applied to physical objects. What they mean by it is that whether a natural object is beautiful or not does not depend upon itself, but upon what *we* can make it mean. 'Nature is mute' says Croce, 'if man does not make her speak'. But we may, perhaps, dismiss that view for this reason among others, viz. that while, according to it, all external objects must stand on the same footing, some actually appear to us as more attractive and arresting than others. Assuming then that there is no absurdity in speaking of beauty in nature, I may point out that that beauty in its entirety—immanent, as the poets say, in everything 'from the creeping plant to sovereign man'—is beyond common human experience. Such of it as ordinarily comes into view may be the beauty of single objects like a smiling flower or of a natural scene like a landscape radiant in the morning sun. In either case, it is but a fragment of nature that is presented; and we cannot lose sight of its boundaries at the time of appreciating it, as it necessarily appears in its cosmical context. It thus differs from a work of art which is a world by itself, and is so self-complete that it has been compared by some to a monad. In this respect, the beauty of nature, as it ordinarily reveals itself to us, hardly reaches the level of beauty in art which absorbs our entire attention. And so long as the appreciation of nature is piecemeal, the deficiency of transience pointed out above in the case of art experience is also here, because the fragmentary spectacle cannot be held before the mind for very long. Sooner or later it is succeeded by another, and the experience to which it gives rise may be altogether unaesthetic. There is also the possibility here of a beautiful spectacle in nature, because of its reality, changing its appeal from the aesthetic to the practical, even within the time it is kept in sight. A person admiring the scenic beauty of a mountain may conceivably be diverted from it at any moment by the thought of some practical purpose, say, of making the place fit for a health or holiday resort. It may thus become the focus of a different kind of interest; but no such diversion of interest is conceivable in the case of art, because its object is unreal. To a person contemplating the same mountain depicted in a picture, the idea of making it subserve a practical end does not occur at all. Thus the realisation of beauty in nature can no more be the final ideal than the realisation of beauty in art can.

That an exclusive devotion to the pursuit of beauty, whether in art or in nature, does not satisfy all the needs and aspirations of the human heart is, indeed, a theme which is familiar to readers of poetry. Tennyson's *Palace of Art*, for instance, is based upon it. In that poem, as is well known, the poet describes a gifted soul as building for itself a fine and spacious mansion amidst magnificent surroundings, but on the summit of a hill far away from the common people. After ornamenting it with artistic works of great beauty and splendour, it enters the happy abode saying to itself, 'All these are mine; and let the world have peace or wars, it is one to me.' This self-complacent attitude, no doubt, does not continue very long, because the soul, which has thus isolated itself from others, grows penitent of its pride and unsocial behaviour and, at last, steps down from its lofty mansion to join the common life and share its sorrows and its joys. But the poem makes it clear that there is nothing in aesthetic experience itself to guarantee against a life of self-centred satisfaction. The ideal of perfection, if it should answer to that description at all, cannot allow any side of human nature to be starved; and it will not herefore be ever divorced from sympathy for fellow beings.

I have dwelt at some length on the inadequacy of the value of beauty to serve as the final ideal. Similar defects characterise the other two values also; but it will suffice to refer to them only briefly now, as I shall deal with them again later in this lecture.

(2) Goodness

This term, as is well known, is extremely ambiguous. But it is enough for our immediate purpose to take it in its most usual sense of the moral good and understand by it, in particular, what is signified by the golden rule, viz. that we should do to others, as we would desire them to do to us.² Man's belief in the need for such altruistic activity arises directly from his self-conscious nature, for he thereby becomes aware not only of his own self but also of others as having selves like his own and as subject to the same feelings of pain and pleasure as he is. That is to say, man realises through it that he is a social being, with obligations to discharge towards others amidst whom he lives. But when we remember that he, as a natural being, has also lower motives to contend with, we see that the pursuit of the good requires strenuous and continued effort; and so long as there is need for conscious effort, it is clear that the ideal is not

2. *Ātmanah pratikūlam yat parasya na tadācaret.*

reached. The moral good cannot therefore represent the final goal of life, until self-love is wholly overcome and altruistic service becomes the effortless expression of a permanent attitude of mind. Long training in social morality may establish in us habits of right conduct, and moral activity may thereby become a second nature with us. But such training, by its very nature, is adjusted to a general standard; and, while it may ordinarily be adequate to guide us aright in situations that more or less conform to that standard, it cannot be trusted to do so always. For there are sure to arise new situations in life, or there may suddenly present itself a conflict of duties, when it may fail us. Such situations will give rise to a tension of mind which cannot, unless moral success is a matter of pure chance, be got over till we are able to perceive for *ourselves* the kind of action which they demand of us. This perception presupposes common social morality, as its indispensable basis; but it also needs, over and above it, as I shall try to point out, a knowledge, or more strictly an intuitive understanding, of the ultimate truth about reality. In other words, goodness as a value depends for its complete realisation on another member of the trinity, viz., truth, and cannot therefore by itself stand for the highest ideal.



(3) *Truth*

The deficiency of art experience, viz. that it is transient, because of its dependence upon a situation created by the artist, is not found in the case of philosophic truth, for it has direct reference to reality. Nor does it suffer from the other drawback of fragmentariness characterising our sense of beauty in nature, for such truth is all-comprehensive, its object being the whole of existence. Any satisfaction, which its discovery may have for man, should therefore be quite stable. Further, the pursuit, as in the case of art and morality, is also marked by unselfishness, for truth, in its pure and undefiled form, is not likely to be attained if it is not sought for its own sake. Its purpose is to satisfy disinterested curiosity, and the intrusion of any personal interest like gain or glory is sure to vitiate the result that may be reached.

But, all the same, this value also has its limitation for, as now commonly conceived, it is speculative and signifies a purely theoretical understanding of reality. Such a conception fails to take account of the bearing which philosophy, unless we exclude from it the consideration of the nature of man and his place in the universe, has on his life. Bradley, for instance, states that philosophy

'seeks to gain possession of Reality but only in an ideal form.'³ Another modern thinker writes that 'its mission terminates in the quest rather than any actions that may follow it.'⁴ This bearing upon life, as implied in the latter quotation, is not, indeed, denied now; but, as being of a practical character, it is generally regarded as the concern of religion and not of philosophy. Here, it seems, we have an unwarranted extension to philosophy of a feature found in the pure, as distinguished from the applied, sciences. What I want to point out is that, unlike the truths of the pure sciences, those of philosophy and kindred subjects of study *necessarily* influence life. Indeed, they cannot be prevented from doing so, when once they have satisfied our reason and won our acceptance. A person may learn that the planet Saturn has a certain number of rings encircling it. That is knowing a scientific fact, and the knowledge may have no conceivable relation to his everyday mode of living. But the same cannot be said, for example, of the truth about the survival of the self. It is sure to influence life—in one way if a person believes in it, and in quite a different way if he does not. The study of formal logic again, to take another instance, with its exposition of the nature and sources of fallacious reasoning cannot be without its effect on the thinking of those that devote themselves to it. The ultimate truth of philosophy is of this kind; and, if what I have said about its significance for man is correct, it must contain a reference, latent or explicit, to the final ideal of life which, as an ideal, implies that he ought to aim at realising it in fact. To separate the theory of truth from its practical implication⁵ is to make of philosophy a mere game of speculation; and to rest in it is not to realise truth, but rather to leave off its pursuit in the middle.

To summarise what has been stated so far: A common feature of the pursuit of these values is its disinterestedness. Any admixture of selfish aim contaminates, and at once brings them down from the high place they occupy in the scale of values. If, for instance, a person tries to do good to others in order that they may do good to him in return, or even that he may thereby enjoy the consciousness of his own goodness, he is not really acting morally. In the words of the Gītā a moral action, truly so described, signi-

3. Bradley: *Essays on Truth and Reality*, p. 12.

4. J. S. Mackenzie: *Ultimate Values*, p. 26.

5. As thus philosophic truth is not utilised for achieving an end *external* to it, there is no contradiction here of what was stated earlier, viz. that it should be sought for its own sake.

fies that it has been prompted by *sattva*, and not by either *rajas* or *tamas*. A person may repay a debt willingly or unwillingly; and the act may outwardly appear to be the same. Really, however, it is very different, for it is not the act alone that counts but also the spirit or manner in which it is done. 'God cares a great deal more,' some one has stated, 'for adverbs than he does for verbs'. It is chiefly because of this feature of disinterestedness that these values are termed 'higher,' to contrast them with others like wealth or valour which are generally tainted by selfishness and are therefore lower or impure. Apart from this common feature, which is negative, each value has its own positive excellence. The pursuit of the good signifies altruistic service; that of the beautiful results in relief from the perpetual tension of life as it is commonly led; and that of the true yields comprehensive knowledge which, by removing all doubt and uncertainty, produces a stable conviction. But each has also its peculiar limitation. The first is necessarily characterised by strife, and can never be fully achieved in and by itself; the second may, no doubt, be realised but only for a limited time; and the third, as commonly understood now, being purely speculative, may prove utterly barren of result so far as practical life is concerned. Thus, though the realisation of these values means the overcoming of certain prominent deficiencies of common life to a greater or less extent, they have defects which render them, on the whole, unfitted to serve as man's final ideal, the attainment of which alone can completely satisfy his spiritual nature.

But it is necessary to guard against a possible misapprehension here. In criticising thus the triad of values, I only mean that none of them is ultimate in the sense of an all-sufficing or absolute value which leaves nothing further to be desired. That is, indeed, clear from the fact that they are reckoned as *three*. But all of them are ultimate in the other sense of being fundamental. Each has its own characteristic feature; and each appeals to a distinctive side of man's spiritual nature. That is, though none of them by itself suffices to be the final human goal, each stands for some necessary aspect of it. No final ideal can exclude altruistic service or restful peace or a comprehensive knowledge of reality.

All the three values are thus included in the ideal. A far more important point about them for us now is that, as shown by their description above, they supplement one another, and are sufficient, when taken together, to yield us all its essential characteristics. What then is the nature of the final ideal? To begin

with, disinterestedness should be a constant and outstanding feature of it. Further features of it are given by the excellences of the three values, but freed from their respective shortcomings. That is to say, conscious effort must disappear in the case of goodness, and moral action must become spontaneous and joyful. The restful peace and relief from the tension of life, resulting from the appreciation of beauty, must be not provisional but constant; and this necessarily implies that it should be derived from the contemplation of the whole of reality, and not merely of a portion of it, or an imaginative situation created by the artist. The complete knowledge of reality again, for which philosophic truth stands, must not remain a mere ornament of the mind but should become the inspiration of daily life. To set free these values from their respective deficiencies will be to metamorphose them totally. In other words, the ideal is not a mere combination of the three values but represents a creative synthesis of them, by which they are fused and welded into a new unity. It may consequently be said not only to include, but also to transcend them. This new ideal is, to characterise it in brief, a state of absolute unselfishness and of spontaneous joy that manifests itself always—whether one is engaged in outward action or is absorbed in inward contemplation. The testimony of Shakespeare in any matter is of great value, especially when it is found in his *Sonnets*, where he is commonly taken to have unlocked his heart. In consonance with his theme there, the poet generally refers only to the beauty of his friend and to truth by which he means the friend's constancy; but in one sonnet,⁶ he mentions the good also, and there he indicates the supreme value of the result of unifying them by speaking of it as quite a rarity:

'Fair, kind and true often lived alone,
Which three till now never kept seat in one.'⁷

Here naturally the question will arise whether such an ideal is at all feasible. How can man, it may be asked, who is finite and fallible, ever become perfect? There is a view held by some thinkers both in the East and in the West, according to which,

6. No. CV.

7. Compare also Tennyson's lines prefixed to his *Palace of Art*, already referred to, where he speaks of these values as

'three sisters
That doat upon each other, friends to man,
Living together under the same roof,
And never can be sundered without tears.'

strife, sorrow and insecurity are necessary features of human life and the only escape from them for man is in betaking himself to a realm which his own mind has fashioned, such for instance as imaginative art. In the actual world, he is entirely at the mercy of blind forces which are sure to frustrate his efforts to attain the ideal. This view assumes that the real neither is nor ever can become perfect, and that the ideal is always bound to remain unreal. It thus postulates a complete lack of harmony between the world of facts and the world of ideals. That is pessimism, pure and simple. It looks upon life as 'a vale of tears' and regards art, to confine our attention only to it, as nothing more than a hobby or pastime to which man may turn for relief from the worries and vexations of routine life. The practical outcome of this view is, as indeed is admitted, the passive virtue of resignation. A person resorting to it, though resigning himself to whatever may happen, may not be insensitive to the troubles of others. But the help which he can render them will be such as depresses him that gives and him that takes, because it has its source, not in love with its creative insight, but in pity for them as fellow sufferers in the same tragedy of life. It may be that this doctrine of despair cannot be logically refuted; yet the best thought all over the world is different; and, in India in particular, the majority of thinkers have all along believed not only in the superiority of the ideal of perfection but also in the possibility of realising it.

We may refer, in support of their belief, to the fact that man is not an alien in the universe but a part of it; and there is consequently no reason why it should prove hostile to him in his efforts to maintain an ideal which, be it remembered, is not the fabrication of a few minds but is implicit in his very nature. The attempt to accomplish it, no doubt, involves an internal struggle, especially in its initial stages owing to the double nature of man already mentioned; but it is his duty, as a self-conscious being, to overcome it. We may even go further and say that he not only ought to overcome it but *must* do so, for the nature of the higher self is such that it will not allow itself to be suppressed or to be subordinated to the lower, unless man has once for all sunk back into the life of the mere animal. Here is the necessity which impels him onwards; and he cannot rest until the opposition between them is resolved, and the lower self has been turned into a willing and ardent ministrant to the purposes of the higher. One may find a brief spell of peace by turning to works of art or other similar means of escape; but that is only to evade the chief problem of life and not to solve it. What is a fact, however, is that

the advance towards the ideal is very much chequered and discouragingly slow; but slow or uncertain progress need not necessarily mean that the pursuit will end in failure. Even if we grant that perfection can never be finally attained, that man's reach will always exceed his grasp, it would be necessary to recognise it as a regulative ideal, in order to determine the *direction* in which man should advance, for no continuous progress is conceivable without reference to a single definite goal.⁸ The adoption of perfection as the one ideal will help him to be ever progressing towards that which he instinctively feels to be his ultimate aim in life. By the term 'ideal' here is accordingly to be understood not a mere glorified idea for, though not finally achievable, there is no degree of approximation to it beyond which one may not aspire. To say that the ideal cannot be actualised is not consequently the same as summarily discarding it as false and futile.

And now as regards art: So far from being a mere sanctuary of escape from the troubles of life, it is an 'intimation' to man of the possibility of realising the ideal. In fact, according to Indian thinkers,⁹ the goal of perfection, in its essence, is already within the experience of all that are familiar with art. Like it, art experience also, as shown by the description of it given above, is altogether impersonal and is marked by pure and spontaneous delight. It gives us a foretaste of the ideal state, and may thereby serve as a more powerful incentive to its pursuit than anything else. By provisionally fulfilling the need felt by man for restful joy, it may induce him to do his utmost to secure it finally. It may have its limitations, such as lack of stability; but they only show that art experience is not the ideal itself, but is merely its analogue. They do not disprove that both experiences are of the same order; and we may well conclude from the fact of the one to the feasibility of the other.¹⁰

But how is this state to be attained? Just as its idea is derived by a synthesis of the three values, it is achieved by a combined pursuit of them all. In other words, they are not only a help in formulating the ideal; they also serve, when pursued together, as the means to reach it. But there is an important difference in the way in which they do so. I have just pointed out the unique

8. The alternative of a plurality of goals, like the triad of values, may prove distracting or lead to indulgence in caprice.

9. Cf. *Brahmāśvādamiva anubhāvayan: Kāvya-prakāśa*, iv. 26-8.

10. The same remark applies to the beautiful in nature also.

manner in which the pursuit of the beautiful may help the attainment of the ideal. Being only analogous to it, the help it renders is indirect. By carrying us to the threshold, as it were, of the ideal and giving us a glimpse of it, art but inspires us with a desire for realising it. Unlike it, the other two values of goodness and truth, have a direct role to play; and they actually lead us to it, if pursued in intimate relation with each other. I shall now briefly point out how their correlated pursuit transforms both of them, and results in the ideal which is higher than either.

(1) The defect of a purely speculative knowledge of truth, as stated above, is that the seeker of it may feel satisfied with the intellectual conviction which it brings, and that it may therefore remain all unrelated to life. Instances are not wanting to show that strong theoretical convictions may coexist with defective conduct. But it may be asked how such dissonance between philosophic belief and practical life is possible, if, as I have said, there is a necessary connection between them. The answer is that the belief does tend to influence life but that there are undisciplined impulses in man which, without his knowing, assert themselves and prevent it from doing so. It is on account of such unconscious assertion of them that we, in actual living, lose sight of the truth, although we may have given our intellectual assent to it. Here we see the need for connecting the pursuit of truth with that of goodness. If these impulses are brought well under control by means of systematic moral training, philosophic truth comes, of itself, to influence life; and the process of its embodiment in practice deepens and intensifies our understanding of it, as mere arguments never can. The reason for this is the constant dwelling upon the truth necessitated by its application to everyday conduct. It removes gradually from our mind all beliefs which are incompatible with the philosophic truth we have learnt; and, as the pressure of these false beliefs grows less and less, we become more and more intimate with the truth and assimilate it better and better. When this process of inward assimilation advances sufficiently, the knowledge of ultimate reality, instead of remaining a mere intellectual conviction, becomes suddenly kindled into an intuition of it. We then see the truth *for ourselves*, and may be said to have made it our own.

The term 'intuition' however, as ordinarily used, is notoriously ambiguous; and it is therefore necessary to add a few words as to what I mean by it. Broadly speaking, there seem to be two senses which the word bears: it signifies either a means to the dis-

covery of new facts, or only a change in the mode of viewing what is already known. The ambiguity attaching to the term appears to be largely traceable to a confusion between these two uses. I am using it here in the latter sense, as equivalent to merely an altered way of knowing a thing already known which, in the present case, is the truth about reality as a whole. This truth, whether it is learnt from others or reached through reason, is comprehended by us only mediately or from without; but, when intuited, it becomes realised from within. Or, to state the same in other words, thought becomes thereby transformed into experience. The Sanskrit word *jñāna*, we may note by the way, is used indifferently in these two senses, and may mean either mediate knowledge or direct experience. But sometimes it is distinguished from *viññāna*, which corresponds exactly to 'intuition' as used above. Śaṅkara, in his commentary on the Gītā where this distinction is made, says that *jñāna* is mediate knowledge of truth, and that *viññāna* means the same but 'as brought within or transmuted into one's own experience.'¹¹ It is this feature of immediacy that is common to both kinds of intuition. There is nothing mysterious or occult about intuition in this use of the word, as there may be in the other. It also claims, no doubt, to be true like the other; but that is because it depends upon what has already satisfied our intellect and won our acceptance, and not independently as in the other case. It would, perhaps, be better to describe it as immediate experience or insight than as intuition. As an example of such immediate experience, we may give a man's awareness of his own pain or pleasure or any other aspect of his inner life, as distinguished from his knowledge of the corresponding states affecting others. A doctor understands the ailment of his patient through its symptoms or from the outside, while the patient himself experiences it from the inside.

(2) This is how knowledge of truth is transformed when its pursuit is combined with that of goodness. The reverse also takes place since what we believe, as already observed, cannot but influence what we do. When the living of the good life comes to be illumined by the knowledge of ultimate truth, it will be charac-

11. *Jñātānām tathaiiva svānubhava-karaṇam* (vi. 8). Cf. iii. 41, ix. 1., and xviii. 42. We may substitute for this all mediate knowledge, whether it is derived through others' teaching, inference or logical construction. It may even be due to another's intuition in the first sense, if such be admitted. In all these cases, there may be need for changing it into immediate experience. It is only when the original knowledge is *one's own* intuition, in the sense of discovery, that there is not this need.

terised by a new spirit of confidence. The reason why such confidence is lacking in the pursuit of the good by itself is that moral action, signifying as it does a reaction to objective situations that demand some change, presupposes a proper, though only an implicit, appraisal of them. But every such situation is necessarily relative and fragmentary; and, if it is true that nothing can be fully known except when it is viewed in the perspective of the whole of reality, a proper reaction to it requires complete knowledge. But, ordinarily speaking, man cannot help regarding each situation, more or less, by itself. To set about changing it without a full and clear understanding of it, can only result in activity which is faltering and uncertain; and it may or may not be adequate to meet the requirements of the given situation. An element of contingency thus enters into all moral action. This difficulty in determining what course is right in pursuing the good explains the importance that has all along been attached in the moral life to adherence to social custom. The Mahābhārata says that, as the secret of *dharma* is hidden from man, the only course open to him is to follow the example of the better minds of the community to which he belongs.¹² It also seems to be at the root of the practical maxim 'Do the duty that lies nearest to you.' But with a direct experience of reality, man's reaction to any presented situation becomes quite decisive, because he can perceive at once its connection within it. He will be, to cite an illustration given by Bergson, in the position of a person who is appreciating a series of pictures relating to different phases of a city which he has seen, and not in that of one who is trying to do so without a personal knowledge of it. Morality, even then, continues to be the response of the agent to individual situations; but, owing to the comprehensive vision of reality that is his now, it ceases to represent tentative or *ad hoc* decisions as before, and all his actions will find their explanation in his new orientation towards the world, though in diverse ways.

The same insight into the nature of the whole of reality, by revealing the integrity of one's own self, also puts an end to the inner strife between the higher and the lower selves which, as stated earlier, is a great hindrance to the leading of the good life. It is the operation of lower motives that comes in the way of the higher activity. When a person rises above them, his actions, while they may be different considered in their individual aspect, will all alike

12. *Dharmasya tattvam nihitam guhāyam mahājano yena gataḥ sa panthāḥ.* (iii. 314 st. 119).

point to the same unvarying attitude towards the ideal of goodness. Hence conduct and character cease to be externally related; and the one becomes just the outward manifestation of the other. That is to say, philosophic insight determines a man's line of conduct finally, and all his voluntary actions will therefore constitute a consistent whole.

Thus the knowledge of philosophic truth, when it is changed into an immediate experience, transforms the attitude of the moral agent towards himself as well as towards the situations to which he is to respond. An important consequence of this double transformation is that the strifes and perplexities of ordinary life cease, and the doing of good becomes a matter of spontaneous joy. Man becomes self-forgetful in acting; and, though exercising self-control, he will not be aware of it. Self-consciousness being thus transcended, man's experience in the new state may be described as resembling that of art. In fact, art becomes superfluous to him for he reaches the kind of experience, which it can induce, through all voluntary activity. Even when he is not acting and is contemplative, he attains the same attitude since, thanks to his new vision, he sees beauty in nature always, and sees it not in this or that aspect of it merely but in it as a whole. Nay, his attitude then is higher for, in addition to its being detached and restful as in art experience, it is derived directly from nature; and any value is higher, other things being the same, if it is realised through the true instead of the untrue. I may quote in support of this view the following from the *Principia Ethica*¹³ of Prof. Moore: 'We do think that the emotional contemplation of a natural scene, supposing its qualities equally beautiful, is in some way a better state of things than that of a painted landscape; we think that the world would be improved if we could substitute for the best works of representative art *real* objects equally beautiful.'

When goodness and truth are thus pursued together, they serve as complementary to each other and lead to the same result, as the two eyes in seeing lead to the perception of one form or the two ears in hearing to the perception of one note. Knowledge that does not influence practical conduct is an empty accomplishment; and conduct that is not rooted in complete knowledge is only blind striving.¹⁴ Indeed, the relation between the two is so intimate that neither can entirely

13. P. 195.

14. Cf. *Hatam jñānam krīyā-hīnam jñāna-hīna hatā kriyā*.

fulfil its true aim without the aid of the other. The identity of the result which they yield, if they are properly pursued, is what Socrates meant when he said 'Virtue is knowledge.' It may seem a paradox to us because we commonly take knowledge to stand for mere intellectual conviction which, as already pointed out, may coexist with defective conduct. But it is used here to mean direct experience, which necessarily expresses itself in virtuous conduct. We sometimes think that we knew an act to be wrong, and yet could not help doing it. As an old Sanskrit saying has it, 'Man knows *dharmā*, but he does not practise it, and he knows *adharma* but does not desist from it;'¹⁵ and there is also its Biblical counterpart, 'The good that I would, I do not; the evil that I would not, that I do.' The fact is that in such cases we only know by hearsay that the act is wrong. If we knew it for ourselves and it was a self-won conviction, we could never have willed it. That is the meaning of the saying 'No one does wrong wittingly'. Our fault is thus really not so much a weakness of will as a lack of direct knowledge. It is, as a result of this combined pursuit of the good and the true, that man attains the ideal of perfection, which may be described indifferently as joyful and disinterested activity inspired by complete enlightenment, or as complete enlightenment which expresses itself as joyful and disinterested activity.

It is the quest of perfection, in this sense, that is the hidden meaning of all human endeavour. The ideal is exactly the same as what Indian thinkers designate as *mokṣa*, and whose achievement they regard as higher than either *dharmā* which may roughly be taken to stand for the moral good, or *jñāna* which is knowledge of philosophic truth. As in the case of the ideal so far considered, it also is reached through the combined pursuit of these two. Since, according to the common view, *mokṣa* is a state to be achieved on a supernatural plane, the above identification may appear strange. But I shall deal with this and connected points about the conception of *mokṣa* in the next lecture.

15. *Jānami dharmam na ca me pravṛttiḥ, jānamyadharmaṁ na ca me nivṛttiḥ.*

LECTURE II

I tried to show in the first lecture that the ultimate purpose which man continually endeavours to attain, though not always with a clear knowledge of it, is self-perfection. I also indicated that this ideal had risen to the level of explicit consciousness in the Indian conception of *mokṣa*. My aim to-day will be to explain this conception. I shall also point out that the ideal for which it stands unfolded itself only gradually and that even now, though all Indian thinkers are agreed regarding its ultimacy, there is disagreement among them about several of its details. So far as the latter aim goes, I shall be concerned with what the terms of the endowment describe as the increasing revelation of man's ultimate purpose in the course of the ages. But it is not necessary to treat these two points separately. I shall begin with the second of them, which relates to the progressive unfolding of the ideal; and I hope that, in dealing with it, the first also *viz.*, the conception of *mokṣa* will become clear.

To judge from the literature that has been preserved, the conception of *mokṣa* is found for the first time in the history of Indian thought in the Upanishads; and since they are separated from the earlier portions of the Veda by several centuries, we may conclude that it dawned upon the Indian mind only after a prolonged search. But the stages by which the advance towards it was made cannot now be traced, because the long prevalence of the ideal finally reached has led to their almost complete obliteration. Yet so much is quite clear, *viz.*, that the true and the good were pursued separately as ultimate values before *mokṣa* came to be thought of:

(1) *Truth*

The surviving literature of ancient India may be said to start with the ideal of speculative truth, or truth sought for its own sake. The purpose of several philosophic hymns in the Rigveda is little more than the satisfaction of theoretic, or what is called contemplative, curiosity. The cosmogonic hymns, in particular, illustrate this point very well; and their mythology may well be described as the nature-philosophy of the age. The poet-philosophers of the day marvel at the vastness and splendour of the universe, and exhibit a passionate desire to know how it came into being. One of them, for instance, asks of what material it is constituted, 'What

was the wood and what the tree from which they fashioned forth the earth and heaven ?' ;¹ and another, casting a speculative glance at the heavens, enquires, 'These stars which are set on high and appear at night, whither do they go in the day-time ?'²—questions which suggest no motive beyond the mere desire to know. The answers given, as may be expected, are various, being based upon the beliefs prevalent at the time in the religious and other spheres of life. But the Indian came in course of time to conceive a dislike to the pursuit, in such matters, of theoretical knowledge as a final aim, and to feel that it should be sought only if it be useful in the attainment of some practical end. It is quite a commonplace to find it stated in the beginning of serious treatises in Sanskrit that the useless,³ like the obvious, merits no investigation.

(2) Goodness

The other value of goodness also was once pursued for its own sake; but it is necessary, before considering it, to explain the significance of the word *dharma* which, as I stated yesterday, might be taken as roughly equivalent to it. According to popular usage as well as some systems of thought,⁴ *dharma* signifies moral merit, which consists in or results from practising virtues like temperance, charity and compassion, and is therefore the equivalent of goodness. That, however, is not its sole meaning. It is sometimes used to denote ritual or religious duties ;⁵ and, when so used, it points to activity whose final aim is to secure some personal good to the agent. But even then, the idea of *dharma* necessarily presupposes moral goodness, in its double aspect of devotion to social duties and cultivation of private virtues. There is a simple story narrated in the Mahābhārata (xii. 124) to illustrate this point. Once upon a time, it is stated here, Prahlāda, the king of the demons, defeated Indra in battle and took over from him the whole of the heavenly kingdom. Distressed at this discomfiture, Indra went to his victorious opponent in the guise of a pupil, and served him most dutifully for a long time. Pleased with that service, Prahlāda conferred

1. Rigveda, X.31.7.

2. Ibid, I.24.10.

3. E.g. the number of *kāka-danta*. The taste for speculation as such, however, did not entirely disappear. In almost every department of learning, we find discussions whose bearing on practical life is very slight. But this is only the exception that proves the rule.

4. See *Vātsyāyana* on *Nyāya-sūtra*, I. i. 2.

5. See *Bhāṣya* on *Mīmāṃsā-sūtra*, I. i. 2.

a boon upon Indra, leaving the choice of it to him. Indra then asked Prahlaḍa as to how he had come by such a splendid kingdom ; and learning that it was the fruit of his goodness he asked for its transfer to himself—a device by which Indra in the act of securing virtue for himself, would deprive his enemy of it. Bound by his promise, Prahlaḍa agreed. Soon after, he saw something radiant emanating from his frame and passing out. When he questioned what it was, it replied that it was his own virtue moving towards its new abode. But that was not all. Immediately after, he saw another apparition of the same kind ; and, on being questioned similarly, it replied that it was *dharma* following virtue unable to bear separation from it. The point thus concretely illustrated in this story, which we have to note, is that the relation between goodness and *dharma* is necessary, so that to speak of a person as devoted to *dharma* is to imply that he is of a virtuous character. With this implication of *dharma* in our mind, we may pass on to consider the place assigned in early Indian thought to the value of goodness.

Passages, commending the pursuit of *dharma* as an end-value, appear on a much larger scale in the Veda than those pointing to truth sought for its own sake. The whole of the Brāhmaṇa literature, which forms the bulk of the Vedas, may be said to be concerned with it. In the language of a somewhat later epoch, it may be described as the *tri-varga* or threefold ideal for, according to it, the only legitimate human values are three, viz., *dharma*, *artha* and *kāma*, of which the latter two are to subserve the first. This view excludes *mokṣa* from the sphere of the higher values, and therefore also *jñāna*, or knowledge of ultimate reality, which is but a stepping-stone to it in the opinion of all the schools that uphold that ideal. Whatever use was found for knowledge in that view was as subordinate to *dharma*.⁶ But, unlike speculative truth, this value continued for long to be recognised as ultimate. In many portions of the Mahābhārata we find only the *tri-varga* ideal set forth, although the final purport of the epic, in its present form, may be *mokṣa* as expert interpreters point out. Āpastamba again refers to it in his Dharma-sūtra;⁷ and Jayanta in his *Nyāya-mañjarī* alludes to a school of thought which, in controverting the ideal of *mokṣa*, says ‘It is all very well to talk of it as the highest value. But is it feasible at all? Really the values are only three—*dharma*, *artha* and *kāma* ; and the so-called fourth value is nothing but a

6. According to the principle enunciated by Jaimini in his Sūtra (I. ii. 7). Cf. Saṃkara’s com. on *Vedānta-sūtra*, I. i. 4.

7. II. xxiii-xxiv.

myth. When distress overtakes a man by the death of those near and dear to him, he may talk of *mokṣa*; but when it comes to a question of actually pursuing it, he fails to find any truly practical means to its successful achievement.⁸

To consider now the ideal of *mokṣa*. As already stated, it is mentioned for the first time in the Upanishads; and the fact that they are regarded as the crown of the Vedas points to the belief that it came, in course of time, to be taken as the highest value. But it should not be understood from this that either *dharma* or *jñāna* was excluded, for we come across statements in the Upanishads which emphasise the need for both in attaining the ideal of *mokṣa*. The Śvetāśvatara Upanishad, for example, declares that where *dharma* or ritual is practised, 'there inspiration is born' (ii.6), and also that 'there is no winning of the goal of life except through knowledge' (iii.8). While admitting that *jñāna* and *dharma* or *karma* (to use the term which is commonly substituted for it in this context) are necessary, these early thinkers seem to have discussed for a long time their relation to each other and to the final ideal.⁹ The Īśa Upanishad (st. 9-11), for instance, places equal emphasis on both (*ubhayam saha*); but others, like the Brhadāraṇyaka (IV. iv.22), assign a relatively subordinate position to *karma*. The same diversity of opinion survives in the later schools of Vedānta, some subordinating *karma* to *jñāna*, others regarding them as of co-ordinate importance. Without entering into details, we may note that all the schools of Vedānta, while admitting the need for both, refuse to subordinate *jñāna* to *karma* as the Mīmāṃsā does.

The new ideal not merely includes the old ones; it also transcends them as shown, for example, by the statement in the Īśa Upanishad to which I have just referred. According to it, *karma* and *jñāna* yield their own distinctive fruits;¹⁰ but the result to which they lead, when pursued together, is higher than either of them. In this process of combined pursuit, the two values are totally transformed; and the transformation is precisely like that which, as pointed out in the previous lecture, the good and the true should undergo, if they are to culminate in the ideal of perfection. In the first place, *jñāna* changes from being mediate knowledge to imme-

8. Pp. 513-5. This view seems to have been held by the early Mīmāṃsakas or, more strictly, the Yājñīkas.

9. See *Vedānta-sūtra*, I.i.iv and III. iv. 1-17.

10. Cf. *Karmanā pitr-lokaḥ; vidyayā deva-lokaḥ* (Br. Up. I.v.16),

diate experience. That, for instance, is the significance of Upanishadic passages which prescribe a course of meditation upon the final truth after it has been learnt.¹¹ In the second place, *dharma* also undergoes a similar change. Conceived as an ultimate value, it serves, as indicated earlier, a double purpose—securing some personal advantage to the agent, and ministering to the good of others. Of these two, the former or the egoistic aim is here wholly given up, according to the well-known teaching of the *Gītā*;¹² but its altruistic purpose continues as before, so that *dharma* becomes service to others rendered in a spirit of absolute detachment.

A similarly protracted investigation, it may be added, was carried on regarding another point touching the nature of the ideal. The goal of human existence, as first conceived in India, was the attainment of unalloyed and everlasting happiness in a future life by offering sacrifices to the numerous deities believed in at the time, and otherwise propitiating them. Whatever may have been the nature and extent of the self-sacrifice presupposed by a successful achievement of that goal, it cannot be gainsaid that it was finally the seeking of happiness for oneself. This hedonistic aim naturally gave rise to a reaction; and we find springing up various other schools adopting the opposite view and representing the goal as one not of happiness, but only of freedom from pain and suffering. This negative view was advocated, for instance, by the followers of the Nyāya-Vaiśeṣika and the Sāṅkhya-Yoga. There was a reversion from it, afterwards, to the positive ideal of bliss in the Vedānta, which stands for the final verdict of the Indian mind in this, as in so many other, respects. According to all forms of it, the final state of release is characterised not only by the absence of suffering but also by the presence of bliss.¹³ The restoration of the earlier aim, it must be added, also meant its sublimation, since the bliss or happiness of *mokṣa* is not conceived as a new acquisition by the self but as the regaining of what is intrinsic to it. Further, the notion of the self itself is in one way or another profoundly transformed in all the schools of Vedānta. In the theistic schools, like the Dvaita and the Viśiṣṭādvaita, it is conceived as completely dependent upon God, while according to absolutistic doctrines, like the Advaita, the individual self as such ceases to be, because it merges in the universal self.

11. E.g. *Vijñāya prajñām kurvīta*: (Br. Up. IV. iv. 21).

12. Cf. Īśa. Up. st. 1 and 2.

13. Cf. *Tarati śokam ātma-vit*, Ch.; Up. VII. i.3. *Rasam hyevāyam labdhvā ānandī bhavati*, Tait. Up. ii.7.

The point to be specially noted about this ideal, whether conceived as negative or positive, is that when once it was definitely formulated, it came to be accepted by all the Indian thinkers as the highest of human values. Even the Mīmāṃsakas, the direct successors of the old exponents of *dharma* in the sense of ritual, from whom determined opposition to it might have been expected, acknowledged it; and there is reason to think that the new ideal had been adopted by them by the time of Upavarṣa, who is commonly referred to the early centuries of the Christian era. Thus the conception of *mokṣa* marks a definite advance in the search for the ideal in India; and the step which India took in this is unique in the whole history of human thought. We may have a purely practical ideal or a purely speculative one elsewhere; and we may occasionally find even a welding of the two with a view to reach a higher goal. But the explicit formulation of it, and its acceptance by all thinkers and once for all is peculiar to India alone. It means that there are two aspects of man which need to be taken into consideration in arriving at the true conception of his highest ideal. In the first place, he is ignorant of the ultimate truth; and he is also aware of that ignorance, as shown by his very efforts to philosophise. It is not, however, his only shortcoming. If it were, a knowledge of the ultimate truth would suffice for him to attain the goal. But it does not, for every man, according to his past, has more or less of selfish impulses in him; and these need to be brought under proper control, if not altogether eradicated, before he can achieve the ideal. So long as he is subject to their influence, he can neither whole-heartedly pursue the good nor even effectively strive to acquire metaphysical truth—the two necessary requirements for self-perfection. This does not mean that an exclusive attention to either of these aims, viz., goodness and truth, is not of any value. Both, to be sure, leave their elevating influence behind. In the case of moral practice particularly, to quote the words of the Gītā (ii. 40), even a slight advance made has a lasting value. What is meant is only that the *complete* development of man's nature rests not on the purification of the impulses alone nor on the removal of ignorance alone, but on both. In fact, as we have already seen, neither can be achieved finally without the help of the other; and the culmination of the one process implies the culmination of the other¹⁴

14. *Na hi sarva-kāmānām vimokḥ paramātma-sākṣātkāramantareṇa upapannah: Citsukha's Tattva-pradīpikā*, p. 395 Nirn. Sag. Edn.). Cf. *Bhāṣya* on *Yoga-sūtra*, i.16; *Jñānasyaiva parā kṣāthā vairāgyam*.

Though agreement has thus been reached in regard to the status as well as the essential nature of the ideal, there are still important points about it which remain undecided. I have already had occasion to allude to one such point, viz. the yet unsettled controversy concerning the precise relation of *karma* and *jñāna* to each other and to the ideal. I shall mention two more; but, in so doing, I shall confine my attention, as I have for the most part done thus far, to the schools of the Vedānta. The other doctrines, including the orthodox Mīmāṃsā have for long been superseded completely so that it is not really necessary to refer to them in reckoning up the final conclusions of Indian thought. They mark but stages in the unfolding of the Indian ideal; and their primary interest now, so far at least as our immediate purpose is concerned, is historical.

(1) The first point concerns the question whether or not the ideal can be attained in the present life. Among the Vedāntins, none but Śaṅkara holds that this is possible.¹⁵ He does not, indeed, mean that all will attain it here and now; but the point is that, according to him, there is nothing inherent in the nature of the goal of perfection to prevent its achievement in the present life. He is well supported in this by the Upanishads which, though they also refer to *mokṣa* as taking place after death, contain several statements which show that it can be achieved here. One of the most explicit among them is the following: 'When all desires dwelling in the heart vanish, then a man becomes immortal; and (even) here reaches the goal.'¹⁶ The other Vedāntins explain such statements as more or less rhetorical, and maintain that release is possible only after death. Even so great an authority as Āpastamba¹⁷ ridicules the idea of achieving perfection when one, to all appearances, still continues to live under finite conditions. But Śaṅkara states, in one of the very few passages in which he seems to refer to his own experience, that the matter is one of personal knowledge and that it is not for another to deny it.¹⁸ Even those who refuse to accept the possibility of *jīvanmukti*, as this is called, admit that man may reach so near to the ideal here that release will result *immediately after* physical death. What they insist therefore is only that the process of preparation should not

15. Some of the non-Vedāntic schools of Indian thought, like the Sāṅkhya and Buddhism, also accept *jīvanmukti*.

16. Kāṭha Up. II.iii.14.

17. Dharma-sūtra, II. xxi. 14-16.

18. Com. on Vedānta-sūtra, IV.i.15. This does not make it subjective, for it has the support of *śruti*.

cease *within* this life, but should continue till its end. According to Śaṅkara, on the other hand, there is no reason for such insistence because, if to realise the ultimate truth is the means to it, *mokṣa* must be achieved whenever such realisation takes place;¹⁹ and there can be no interval between the two, as there can be none between the dawning of the day and the disappearance of darkness. One can understand the view that the ideal can never be actualised by us, for it seems to be in its very nature to recede as we pursue it; but, if it is granted that it is achievable, it is hard to see why its attainment should invariably be after this life. This question, it is obvious, touches the conception of the ideal intimately; and it is scarcely necessary to point out that the positivistic view of *mokṣa* advocated by Śaṅkara, makes a greater appeal for man than the eschatological one.

Here the question may be asked whether such complete intuitive knowledge of reality as is required for *mokṣa* can be attained in the present life. The answer to this question depends upon what we understand by the term 'knowledge' in this context. It refers, no doubt, to reality as a whole. But what aspect or aspects of it precisely are intended to be understood by it? It is often assumed that it should comprehend *all* details concerning it. If it does, there is probably something to be said against the conception of *jīvanmukti*, because it is inconceivable how all details relating to the whole of reality—past and future, far and near—can be comprehended by any one in this life. But there is truly no warrant for such an assumption. The knowledge is only of the *essence* of reality—such essence as is suggested by the well-known examples given in the Chāndogya Upanishad (VI. i) to illustrate its all-pervasiveness, for instance, the substance gold in all golden things. To take the advaitic doctrine, with which we are at present concerned, the truth taught in the Upanishads is the oneness of all with the Absolute. Now to intuit this truth, in our sense of the word, is to realise that oneness within one's own experience. Its realisation may be far from easy, but there is nothing impossible in it. The correctness of this view is vouched for by recognised exponents of the doctrine. One of them, interpreting the Chāndogya passage in question, 'When the self is known *all* is known,' writes that the word 'all' there refers only to the inner essence of all things and is not intended to signify the knowledge of each one of them in its

19. See Śaṅkara on *Vedānta-sūtra*, III.iii.32. It is virtually the goal, according to him, and *mokṣa* in the eschatological sense automatically follows after death. Cf. *Vimuktaśca vimucyate*: Kātha Up. II.ii.1.

individual and accidental form.²⁰ No objection, on this score, can therefore be urged against the ideal of *jīvanmukti*.

It is desirable to add a few words in elucidation of this ideal. We should not think that, in the view of those that uphold it, progress and perfection are conceptions pointing to the same level of experience. The one takes place in time; the other signifies transcending it. As Prof. Radhakrishnan says, perfection is not attained within the time order or within the limits of the historical process. It is 'victory over time, a triumphant passage from the historical to the superhistorical.'²¹ That is, perfection is not to be understood as taking place gradually or step by step, but in a flash at some point during the progress. This is the significance of the scriptural passage, quoted by Śaṅkara in his commentary on the Kāṭha Upanishad,²² which means that the knower 'arrives at the goal without travelling.' It does not consist in moving towards a goal, but is a mere change of outlook.²³ Progress and perfection are, indeed, related to each other, but only as time is related to eternity, where eternity is not everlasting time but what transcends it; and that relation cannot obviously be temporal. There is certainly a long course of preliminary discipline prescribed for reaching the goal; but, as Śaṅkara is never tired of reminding us, it serves only as an indirect aid. Or, as we might put it, the discipline is merely for gathering the spiritual momentum needed for rising above the stream of time. This kind of sudden transformation in us occurs whenever any of the higher values is realised; but while in the other cases we catch but a fleeting glimpse of the perfect state, here it is attained once and for all. We touch the ideal there, but fall away from it soon. Here there is no such lapse.

A person that has attained *jīvanmukti* does not abandon activity if, indeed, it is possible for anybody to do so; but the activity becomes wholly impersonal, and he responds to presented situations without relating them to himself. It is this transcending of all subjective or personal valuation which is the significance of the Upanishadic saying²⁴ that a knower is not troubled by thoughts like 'Have I not done the right?' or 'Have I done the wrong?' It means that he rises above the moods of self-approbation and self-

20. *Sarva-padasya sarva-tattva-paratvena tattadasādhāraṇarūpeṇa sarva-jñānasya avivaksitavāt: Siddhānta-leśa-saṁgraha—*(Kumbhakonam Edn.), p. 62 (com.). See also *Pañcadaśī*, xiii: 54ff.

21. *Philosophy*, (1937), p. 264.

22. *Anādhvagāḥ adhvasu pārayiṣṇavaḥ* (I.iii.12).

23. *Avagatireva gatiḥ* (*Ibid.*).

24. *Tait. Up.* ii.9.

condemnation, and not that he ceases from acting. The freed or perfected man thus does not lead a passive life. Nor is his attitude towards the world one of pessimistic fatalism, as it is too commonly assumed. That is clear from our characterisation of *mokṣa* as a state of supreme bliss; and there are many passages, like the song of the soul's unity in the Taittirīya Upanishad (III. x.), which revel in describing the peaceful state of the knower. There are again *saṁnyāsins*, still among us, who are the embodiment not only of loving kindness for all, but also of detached joy of which the serene smile that ever plays on their lips is a sure sign.

(2) We have thus seen that there is nothing in the nature of *mokṣa* which necessarily makes it attainable only in a future life. The second point, which I like to mention, relates to the question whether this ideal is such as can be achieved by one and all or only by some; and, if the former, whether it is to be attained by individuals separately and in isolation from the rest or by all together. This is a detail about which also the Vedāntins have not arrived at any definite conclusion. According to certain schools, like the Dvaita, some are eternally bound; of the remaining schools some maintain that release is for all but that it is for each separately; and others that no one, whatever his qualifications and however far he may advance on the path to it, will attain *mokṣa* until all are qualified for it. The last is what is generally known as the ideal of *sarva-mukti* or universal release. Unlike *jīvanmukti*, there has been a long and keen controversy about it even among the advaitins; but it is clear that there can be no other conception of freedom which makes a wider appeal. The belief of the Indian in the *karma* doctrine which, in its prevalent form, holds each person responsible for whatever he is now or may ever become hereafter may suggest that the conception of release should be individualistic.²⁵ But several great thinkers have believed in *sarva-mukti*, and there are various ways of conceiving the possibility of it recorded in old Sanskrit works. Of these, I shall refer here to one that is least dependent upon the technical postulates of Vedānta.

Long prior to the time of Śaṅkara, there flourished a Vedāntic thinker, named Bhartṛprapañca.²⁶ He also was a monist, like

25. This, of course, does not mean that society is neglected, as is clear from the insistence on altruistic service in the training qualifying for release.

26. See *Indian Antiquary* for April, 1924, for an outline of the views of this thinker. Cf. Nṛsiṃhāśramin's *Vedānta-tattva-viveka*, pp. 34-8. (Chowkhamba Series).

Śaṁkara; but he advocated what is known as the *bhedābheda* view. That is, though he believed in the sole reality of Brahman, he, unlike Śaṁkara, found a place for all variety in it. According to him there is only one soul, but it functions in many centres. The common notion of a plurality of souls is due to this functional divergence and the mistaking of a temporary focusing of experience for the permanent individuality of the experient. But really this individuality only represents one of the numerous points where the single soul operates. Or to express the same in a different manner, the only soul that is, the cosmic soul as we may term it for convenience in referring to it, reveals itself simultaneously through several bodily organisms. A giant banyan tree, judged by its secondary trunks standing apart, may appear to be many; but it is really one for they all meet at the top, the seeming trunks being only roots that grow in the air instead of under the ground. There is nothing novel in this notion of one and the same soul being in relation with many bodies for, according to the *karma* doctrine, a single soul is regarded as assuming different bodily frames in different births, though the bodies there are conceived as succeeding one another *only in time* and not, as here, as coexisting *in space also*. If thus there is only one soul to be liberated, the so-called individual *jīvas*, which are but partial and provisional manifestations of it, can only contribute towards its liberation, which will not obviously result until the effort in that direction of the last *jīva* is successful. All of them should strive, but it is for a common end that they should do so. This unity of purpose, however, is only from the standpoint of *mokṣa*. In regard to other purposes relating to moral or material welfare, the *jīvas* manifestly differ; and their difference, so far, is admitted to be real.²⁷ That is, while every person feels, and feels rightly, that he has his own specific aims to achieve, that feeling is wrong, if entertained towards the final aim of life, because he cannot secure it apart from the rest. In this twofold aim, he resembles, we may say, a planet which, while moving on its own axis, also moves, in accordance with the constitution of the solar system, about the sun as all the other planets do.²⁸

27. This is expressed by saying that, though *avidyā* is one, the internal organs (*antaḥ-karāṇas*) are many. Brahman becomes the cosmic soul through the adjunct of *avidyā*, and it is split up into a manifold of *jīvas* through the different internal organs. The *jīvas* thus have two adjuncts. In Śaṁkara's Advaita, the second of these is traced to the first, so that they are conditioned ultimately by only one adjunct, viz., *avidyā*.

28. The adoption of this double attitude by Bhartṛprapañca towards the

A necessary corollary to this view is that the achievement of the final ideal requires a twofold discipline. The first part of it is for overcoming narrow attachment (*asāṅga*), which is the source of man's wrong belief that he is essentially different from others. He should therefore first rise from this false belief to a consciousness of the underlying unity of all. And the means to it is devotion to social morality and meditation on the truth that there is but one and only one soul, though it shows itself as manifold. It is the conviction that the souls are many and are only externally related to one another that is the source of much, if not of all, moral evil. When that conviction is replaced by the contrary one that they are but the same, the moral evil practically disappears. It is only when this unity of all the selves has been realised, not only in thought but also in fact, and man has shaken off the burden of a separate self that he will be able to work for the further and final ideal of spiritual freedom. If we start with the notions of matter, finite selves, the cosmic soul and the infinite spirit, we may say that the object of the preliminary training is to realise the ultimate oneness of all finite selves with the cosmic soul. The aim of the second part of the discipline is the realisation of the ultimate unity of all Being, including matter, and of that Being as the infinite spirit. The discipline of the second stage also consists in work and meditation ; but it is not necessary to enter into further details. It will suffice to observe that a person, who has experienced his identity with the cosmic soul, will necessarily be actuated by universal love, and that, there being nothing to disquiet him except the consciousness that there are others who have yet to realise the same identity, his main concern then will be to assist them in doing so.

What we have to note particularly in connection with this view is that man must disabuse his mind once for all of the notion that he can reach his spiritual goal apart from others. To say that one's salvation is one's own concern is like saying that the heart or the lungs have their own end to achieve independently of that of the bodily organism as a whole. Whatever separate purpose they may serve is only contributory to *its* well-being. The excel-

self makes his view better than the other views of universal release now commonly known. It avoids the solipsistic position of those that maintain the possibility of such release on the basis of one *jīva* alone, and explain the belief that there are many *jīvas* as purely a delusion. If to avoid this difficulty, the *jīva* is taken to be *in reality* but one, though *appearing* as many, we should be in the self-stultifying position that when one strives for and attains *mokṣa*, all will be released: *Munirmanute mūrkhō mucyate*, as an old saying has it.

lence of this position consists in the fact that it gives no room for the charge that may be brought against the other ideal of isolated release. Whatever may be the extent of altruistic service involved in the training necessary for reaching it, there is no question that that ideal is eventually individualistic. But here it is not so at all. Every one, who is qualified, works for the perfection of all ; and he does so with the full conviction that he has nothing to gain thereby for himself exclusively. Here we have a parallel to the Gītā teaching of selfless duty. It asks man to do his duty without any reference whatsoever to his personal interests. The same principle of detached action is, in this view, extended to the higher aim of *mokṣa*. The teaching of the Gītā is to be followed here also, but not for achieving one's own salvation, as it is usually explained; it is rather for acquiring the fitness to work for the ultimate purpose of universal perfection.

Thus we see that, although the view that *mokṣa* is the highest ideal has been accepted by all Indian thinkers, and the Vedāntins among them are also agreed as regards certain important features of it like its positive and blissful character, there are details relating to it which remain still unsettled. These details, to judge from the instances just given, are such as will, when determined, not only clarify the ideal but also inspire man with fresh motives for responding readily to its call. That man should still be far from the goal of life is not so surprising, for he is governed not only by his spiritual but also by his animal nature. What is surprising is that, with all the attention which the best minds have devoted to it for so long, even the nature of the ideal should be yet not completely known. The ordinary view that it is known and is embodied in the triad of values—the good, the beautiful and the true—is, as we have seen, not correct. Until the ideal becomes quite clear in all its important aspects, we cannot expect true or steady progress towards it to be made. But its further determination, it should be plain from what has been stated so far, does not depend upon mere speculation; it depends also upon an earnest pursuit of it on the practical side, as far as it has been envisaged. That is how the ideal has hitherto been ascertained. Mere theoretical advance is not of much avail; and advance on the practical side only, though certainly more useful, cannot by itself lead to the final goal. It is only when both theory and practice are pressed into service that, on the Indian view, any genuine progress in our knowledge of it can be made. As the nature of the final goal becomes clearer and better understood in consequence of this twofold endeavour, we may be sure that man's march towards it will be less slow and less chequered than it has hitherto been.

BESANT MEMORIAL LECTURES

By

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I

AHIMSA



I consider it an honour to be called upon by the University to deliver the first lectures under the lectureship founded as a memorial to Dr. Annie Besant, the distinguished lady who devoted her long life and inexhaustible energies to the study of the religion, philosophy and culture of India and to the political, moral and spiritual regeneration of this country which she adopted as her own. The terms of the lectureship were made deliberately wide and varied, so as to cover all the fields of thought and activity in which Dr. Besant laboured all the years of her life. The lectureship comprises subjects connected with politics, civics or sociology, religion, philosophy or ethics, education, or the fine arts. The terms of the lectureship offer a very wide choice to the lecturer. The subjects I have chosen for my lectures are, the doctrines of *Ahimsā* and *Asaṅga* in Hinduism. I have been guided in the choice of these subjects by the fact that Dr. Besant was deeply interested not merely in their historical aspects, but also in their bearing on the conditions of the present times. Another reason which influenced my choice was the topical interest of the subject of the *Ahimsā*. The doctrine of *Asaṅga* is of great religious and psychological interest. In my opinion, much confusion and misunderstanding have gathered round these topics, and I hope that the discussion of these subjects may contribute to their elucidation.

I will now proceed with the subject of my first lecture, viz. the doctrine of *Ahimsā* in Hinduism. The doctrine has come to occupy a large place in political talk, and to some extent in thought, but as far as possible, I wish to avoid any reference to political controversies.

The virtue of *Ahimsā* holds a most prominent position in Hindu religious and ethical literature. It is spoken of as the

army. Among the stories told of the king's (Kumārapāla) zeal for life-saving is one of a Bania of Sambhar who, having been caught killing a louse, was brought in chains to Anahilavada, and had his property confiscated and devoted to the building at Anahilavada of a Louse Temple or Yūka-vihāra. According to another story, a man of Nador in Marwar was put to death by Kalhana, the chief of Nador, to appease Kumārapāla's wrath at hearing that the man's wife had offered flesh to a field-god or Kṣetrapāla." (*The Bombay Gazetteer*, Vol. I, Part I, *History of Gujarat*, p. 193).

In spite of their profession of the Jain faith and the absurdities of some of their practices, Jains ruled kingdoms, maintained armies and administered justice. How it was possible to reconcile their practices with their faith is not easy to understand. But it conclusively proves that the unqualified doctrine of non-violence has never been carried out in practice.

The observations I have made above must not be understood as discounting the value of Ahimsā as one of the highest ideals evolved by humanity. Whether and how far this ideal should be modified to suit the exigencies of an imperfect world order is a matter which I do not propose to go into. I would refer those who are inclined to pursue this topic to the very interesting discussion in Chapter XII of the '*Gītā Rahasya*' of that erudite scholar, eminent thinker and fervent patriot, the late Lokamānya Tilak.

The scheme of ethics embodied in the Gītā is not unrelated to the social system prevalent at the time. The duties of the Kṣatriyas or warrior-caste are not the same as those laid down for other castes; nor are the duties laid down for ascetics and for those who lead a worldly life the same.

II

ASAṄGA

The subject of my second lecture is 'Asaṅga' or 'non-attachment'. The English word 'attachment' is the equivalent of Saṅga. It connotes a deep-rooted desire or even devotion. The absence of Saṅga or attachment is not an end in itself but is only a means. What is the end or purpose for the attainment of which it is recommended? Is it a temporal or a spiritual purpose? Even from the point of view of the worldly-minded man it has a high value. The regulation and control of desires and instincts has an important place in any rational scheme of life. Any such scheme would include education, physical as well as mental, the development of one's faculties and aptitudes, the attainment of culture, the cultivation of an equable frame of mind and the fulfilment of one's duties to society. Such a scheme of life would not exclude a desire for the pleasures of life in moderation and with a sense of proportion as between competing objects of pleasure with due regard to a proper scale of values. Atyāsakti (अत्यासक्ति) i.e. undue desire carried to the extent of passion, addiction or devotion to any particular object is bound to cause harmful consequences and is likely to interfere with one's peace of mind, equanimity and happiness.

Does the doctrine of non-attachment involve, from the worldly point of view, the negation or suppression of all desires for pleasures or only some? There are many innocent pleasures and activities to which no reasonable objection can be taken from a common-sense point of view. For instance, love of knowledge and scientific research, love of nature and scenery, love of literature and the fine arts, love of the pleasures of social converse and friendship, love of travelling and love of games and sports when not carried to the extent of becoming a passion. Patriotism or the love of one's country may be carried to the degree of attachment or devotion and may even be regarded as a matter of duty, so long as it does not lead to activities inimical to the welfare of other nations and countries or to an encroachment upon their rights and liberties.

From a spiritual point of view, Asaṅga has a much higher importance as a means to the attainment of Mōkṣa which, accord-

ing to all orthodox Hindus, is regarded as the *Summum Bonum*. Mōkṣa or the release from the bondage of Karma and Saṃsāra or the cycle of births and deaths is not, except in the Nyāya-Vaiśeṣika school, regarded negatively as mere release from pain and suffering. It is regarded as a positive condition of supreme and ineffable bliss in comparison with which all other pleasures and happiness count as nothing. Karma denotes actions, generally, whether in the present birth or in previous births, and I have explained my views on the doctrine in my *Kamalā Lectures* on "The Evolution of Hindu Moral Ideals". No other doctrine has obtained such a hold upon the Hindu mind or penetrated so deeply into Hindu Philosophy and Religion. I hope I may be pardoned for quoting a passage from my lectures on that subject.

"The doctrine of Karma, as I would put it is based upon the following beliefs and assumptions :—

(1) That every act or deed must necessarily be followed by its consequences which are not merely of a physical character, but also mental and moral. It produces an effect upon the character, disposition, instincts and tendencies of the agent. The word Saṃskāra or Vāsanā indicates the physical, mental and moral traits with which a person is imbued and which emanate from previous experiences or actions. They form part of his personality and are borne by him in his lifetime and carried into a future existence;

(2) that the consequences of a person's acts not being fully worked out in this life, they demand a future life for their fruition;

(3) that the inequalities between men in worldly position and advantages and the apparent discord between their characters and their happiness or sufferings, their good or ill-fortune, conflict with our sense of justice and our conception of benevolence of God and call for an explanation compatible with the moral government of the universe;

(4) that the doctrine of immortality of the soul which justifies the belief in a future existence of the individual soul equally justifies its pre-existence; and

(5) that, while the happiness or suffering of a person in this life may not always be due to his own good or evil deeds in a prior birth, but may be due to the operation of circumstances beyond his control, or his actions in the present birth, the possi-

bility of his own good or ill desert in a previous birth as the cause cannot be ruled out”.

(*Kamalā Lectures* on “Evolution of Hindu Moral Ideals”, pages 134-135).

According to the Hindu theory, the chain of Karma is considered to be Anādi, i.e. without a beginning. But it can be snapped or destroyed by Jñāna or realised knowledge. Do all kinds of actions have the effect of adding new links to the chain of bondage? Actions performed from a pure sense of duty without any desire (*Niṣkāmakarma*) would not have any such effect. Even actions performed from desire but without any wish for a personal benefit and free from any taint of egoism would have no binding effect. It may be urged that no human being performs any action without some desire or other. But desire need not be egoistic. It may be for *Lōkasaṅgraha* (लोकसंग्रह) i.e. for promoting the benefit of society or the world at large.

The spiritual discipline required for the removal of the impediment caused by Karma is far more rigorous and exacting in the case of the *Mumukṣu* or the aspirant to salvation than in the case of others. The *Mumukṣu* or *Sādhaka* is a person who has chosen the *Nivṛtti Mārga* or path of renunciation of worldly activities. In the case of those who have not adopted this path but continue their worldly activities and have adopted the *Pravṛtti Mārga*, the restrictions imposed upon desires and activities are of a less stringent character and dictated by considerations of a worldly character. The *Dharma Śāstra* of Manu deals far more extensively with the *Pravṛtti Mārga* than with the *Nivṛtti Mārga*. It is intended to regulate the conduct of life by those who wish to remain in the world as members of society. The division of man's life into *Āśramas* or successive stages is based upon recognition of the needs of human nature and the necessity for the maintenance of society and the human species.

अकामस्य क्रिया काचिद्दृश्यते नेह कर्हिचित् ।
यद्यद्वि कुरुते किञ्चित्तत्कामस्य चेष्टितम् ॥

—(*Manu-Adhyāya* II, Ślōka, 4).

कामात्मता न प्रशस्ता न चैवेहास्त्यकामता ।

काम्यो हि वेदाधिगमः कर्मयोगश्च वैदिकः ॥

—(Manu-Adhyāya II, Ślōka, 2).

“Not a single act here (below) appears ever to be done by a man free from desire; for whatever (man) does it is (the result of) the impulse of desire.”

—(Buhler's Tr. Manu, II, 4).

“To act solely from a desire for rewards is not laudable, yet an exemption from that desire is not (to be found) in this (world); for on (that) desire is grounded the study of the Vēda and the performance of the actions, prescribed by the Vēda.”

—(Buhler's Tr. Manu, II, 2).

It is only in the fourth stage that Samnyāsa or complete renunciation is contemplated. During the stage of studentship and that of a house-holder there is no obligation to renounce the pleasures of the world. The gratification of Kāma or desire including love and the enjoyment of the senses in a manner not contrary to the precepts of Dharma (*Dharmāviruddha Kāma*) is allowed in the case of the house-holder, who is required to follow the family life. He is also allowed to acquire wealth which is necessary for the purpose of enabling him to discharge his duties as a house-holder. A house-holder is under an obligation to perform certain acts of a religious character, failure to perform which is considered sinful. If these religious duties are performed with an expectation of enjoyment of celestial pleasures (*Svarga*) those who perform them are not released from the bondage of Karma and they reap only the reward of celestial pleasures. But if these religious acts are performed without any desire or expectation of heavenly reward they serve the purpose of purification of mind and character. In respect of matters which are not the subject of specific religious injunctions or duties the Manu Smṛti allows great latitude and shows a spirit of accommodation to human nature. Actions of this character may be called *Udāsīna* Karma i.e., Karma of a spiritually indifferent character. They carry no spiritual or religious consequences and are usually preceded by desire. They may be merely moral or non-moral. There is no objection to the desire for the enjoyment of the fruits of such actions. Saṅga or attachment to the objects of desires falling in this category is not sinful. The advice of the Gītā, in my opinion, in regard to these matters is not the abandonment of *Phalēcchā* i.e., the desire for the fruits of actions. What is really

recommended is the avoidance of undue attachment carried to the extent of passion or addiction. The restraints upon conduct in this class of cases are those imposed by the spirit of moderation or prudence, a regard for the just claims of others and a sense of proportion between competing objects of desire. The inhibition of desires and activities beyond these limits is impracticable and would make too great a demand upon ordinary human nature. If, however, a person chooses to abandon the desire for the fruits of his actions, there is no objection to his doing so, and if he practises such renunciation he may be treated as preparing or qualifying himself for the career of a mumukṣu. I have already referred to some examples of innocent human activities which may afford pleasure and enjoyment and which it is neither necessary nor even wise to reject. No higher or more beautiful ideal has ever been placed before humanity than that set forth by Vālmīki in his picture of Śrī Rāma in our national epic. Vālmīki's conception of him is that of the hero as the perfect man. (See cantos 1 & 2 of the *Ayōdhyā Kāṇḍa* in *Vālmīki's Rāmāyaṇa*).

धर्मकामार्थतत्त्वज्ञः स्मृतिमान्प्रतिभानवान् ।

लौकिके समयाचारे कृतकल्पो विशारदः ॥

—(*Rāmāyaṇa-Ayōdhyā*, i, 22)

“Rāma was master of the principles of Dharma, Kāma and Artha, was possessed of an excellent memory, a ready and resourceful intellect and was versed in the customs and conventions of the world and skilful in observing them.”

श्रेष्ठं शास्त्रसमूहेषु प्राप्तो व्यामिश्रकेषु च ।

अर्थधर्मौ च सङ्गृह्य सुखतन्त्रो न चालसः ॥

—(*Rāmāyaṇa-Ayōdhyā*, i, 27)

“Deeply versed in the Vēdas and Vēdāṅgas, in poetry, dramatic literature, poetics etc., he indulged in pleasures only after attending to the claims of Dharma (Duty) and Artha (the acquisition of wealth), and was never given to sloth.”

वैहारिकाणां शिल्पानां विज्ञातार्थविभागवित् ।

आरोहे विनये चैव युक्तो वारणवाजिनाम् ॥

—(*Rāmāyaṇa-Ayōdhyā*, i, 28)

“He was a connoisseur of the Fine Arts and knew how to spend his wealth with discrimination; he was an expert rider and trainer of elephants and horses.”

सम्यग्विद्याव्रतज्ञातो यथावत्साङ्गवेदवित् ।

गान्धर्वे च भुवि श्रेष्ठो बभूव भरताग्रजः ॥

(*Rāmāyaṇa—Ayōdhyā*, ii, 35.)

“ The elder brother of Bharata had gone through a regular and systematic course of learning and had acquired a knowledge of the meaning of the Vēdas and their aṅgas (auxiliary sciences) and had a profound knowledge of the science of music.

कच्चिदर्थं च धर्मं च कामं च जयतांवर ।

विभज्य काले कालज्ञ सर्वान् वरद सेवसे ॥

—(*Rāmāyaṇa, Ayōdhyā*, sarga 100, 64.)

Rāma asked Bharata.—

“ O best of conquerors ! do you divide your time between Dharma, administration and conjugal pleasures with due discrimination? ”

In the case of the Mumukṣu, an aspirant to Mōkṣa, the Gītā prescribes two paths. One is called *Karma Yōga* and the other is called the *Jñāna Yōga* or *Sāṅkhya Yōga*. Whether these two paths are parallel, whether they are of equal value or whether one is superior to the other and if so which, have been the subject of acute controversy in Hindu Religion and Philosophy from ancient times. Śri Śaṅkarācārya is the great protagonist of the view that Jñāna Yōga is the better path and that Karma Yōga is only subservient to the other. In his masterly treatise on the *Gītā Rahasya*, Mr. Tilak has argued with great learning and subtlety that Karma Yōga is at least of equal value, if not actually superior to the Jñāna Yōga. He is of opinion that the view of Śaṅkarācārya and those commentators on the Gītā who have followed him is the result of a desire to support a doctrine to which they were inclined. It would be rash for me to express any definitive conclusion upon this point. It seems to me that Mr. Tilak's opinion is more likely to be acceptable to the modern mind than the other view which leads finally to quietism and complete renunciation of the world, indifference to its affairs and a condition of stolid apathy. Mr. Tilak's view is more in accord with the modern tendency to activism. On the merits of the controversy I must confess to a strong leaning in favour of Mr. Tilak's conclusion which is well supported by authority and reasoning. It will be sufficient for me to refer to the very able and elaborate discussion by Mr. Tilak in the chapter of the *Gītā Rahasya* dealing with Renunciation or Karma Yōga. The

Gītā itself declares that both Sāṅkhya Yōga and Karma Yōga lead to the same goal.

सन्न्यासः कर्मयोगश्च निःश्रेयसकरावुभौ ।
तयोस्तु कर्मसन्न्यासात् कर्मयोगो विशिष्यते ॥
यत्साङ्ख्यैः प्राप्यते स्थानं तद्योगैरपि गम्यते ।
एकं साङ्ख्यं च योगं च यः पश्यति स पश्यति ॥

—(Bhagavad Gītā, V. 2 & 5)

“The renunciation of works and their selfless performance both lead to bliss. But of the two the performance of works is better than their renunciation.”

—(Gītā, V, 2)

“The goal which is reached by men of renunciation is reached by men of action also. He who sees that the way of renunciation and the way of works are one—he sees indeed.”

—(Gītā, V. 5.) (Tr. by D. S. Sarma).

The Sādhaka who has chosen the Karma mārga has also completely to give up Saṅga and engage in Karma purely for the purpose of mental purification. The method of preparation and discipline and acquiring steadiness of mind is practically the same in both the paths. When one has passed the stage of the Sādhaka and become a Sthitaprajña or Siddha, he is, while alive, called a Jīvanmukta. He is under no obligation or compulsion to do anything. But as a result of his arduous process of spiritual education and discipline, he has already attained a spiritual poise, equilibrium and stability; and his conduct, if he does anything at all, instinctively conforms to the highest ideals of altruism and he is guided solely by a regard for Lokasaṅgraha or the promotion of universal welfare. According to Mr. Tilak's view the Jīvanmukta will continue to work for universal welfare and will not give up his altruistic activities. Though actions are generally preceded by desire, abandonment of the fruits of actions is sufficient to prevent any fresh bondage of Karma.

Is the ideal of abandonment of all desire for the fruits of action possible for a person who is neither a Sādhaka nor a Siddha? We are familiar with cases of the disinterested performance of duties. It is being done to-day under war conditions. But is it possible for the bow to be always kept strung and in a state of tension? Can men devote every minute of their lives to the performance of

altruistic duties to the exclusion of all desires for pleasures and with an exclusive regard for the pleasures and happiness of others only? The ideal preached by the Gītā is undoubtedly lofty. But it is very much like an icy peak of perfection which cannot be scaled by ordinary mortals.

मनुष्याणां सहस्रेषु कश्चिद्यतति सिद्धये ।

यततामपि सिद्धानां कश्चिन्मां वेत्ति तत्त्वतः ॥

—(*Bhagavad Gītā*, VII, 3).

“Among thousands of men scarcely one strives for perfection; and of those who strive and succeed, scarcely one knows me in truth.”

—(Tr. by D. S. Sarma.)

Though the Gītā constantly lays emphasis upon renunciation of desires, it would, I think, be more reasonable to hold that it does not forbid any entertainment of desire at all but aims at their regulation and control and that it preaches equanimity of mind without allowing oneself to be enslaved by the senses. One must be neither elated by success nor dejected by failure, neither sanguine nor pessimistic. One must be prepared in mind to take the chances of success or defeat, and must be neither over-joyed by pleasant experience nor depressed by unpleasant experiences. Psychologically, desire is a necessary preliminary to action. Even the performance of a duty is preceded by desire for action. It is, of course, quite conceivable that a man may renounce egoistic desires for the enjoyment of the fruits of action. Let us remember that in describing Himself, the Lord says,

बलं बलवतामसि कामरागविवर्जितम् ।

धर्माविरुद्धो भूतेषु कामोऽसि भरतर्षभ ॥

—(*Bhagavad Gītā*, VII. 11.)

“I am the strength of the strong, free from (excessive) Kāma and Rāga; I am also the spirit of Kāma so far as it is not contrary to Dharma.”

Even Janaka, the philosopher-king, who is generally referred to as the example of one who had attained Siddhi by Karma and become a Jīvanmukta, led a family life and had a wife and child. Is it possible to hold that he became a father without any appreciation or enjoyment of the pleasures of conjugal life? The sage Yājñavalkya had two wives. He appreciated the joy of argumentation and controversial victory and the worth of large herds of

cows. Have our great sages been free from a passion for the pursuit of truth and a desire for the propagation of truth as they conceived it, i.e., their own opinions and systems? Are the pursuit and the love of knowledge to be confined only to the domain of religion and philosophy and not allowed in the field of scientific research? Is Lōkasaṅgraha or endeavour for the welfare of society to be understood as not comprising the advancement of human knowledge? Are the great poets to be regarded as not having made any valuable contribution to human happiness? Are the achievements of creative genius in the fields of literature and the fine arts to be neglected, despised and discarded? Is there any sharp division in the sphere of ultimate reality between spiritual truth and truth in the external world? Is it only the founders of religion who have penetrated into the mystery of the universe or have other truth-seekers been also able to lift the veil and obtain glimpses into the great mystery? The glory of Hinduism is that it preaches the identity of the human soul or Jīva with the spirit and soul of the universe. Is it not a fragmentary view of the universe to hold that the ultimate reality contains no room for the treasures of the human mind which have been won in the course of ages by assiduous efforts? Whether the Self or Ātman is part of the Universe or identical with it, it can participate in all the good which may be comprised in the sphere of universal welfare. Mr. Tilak observes that 'the doctrine of the Gītā is, that instead of killing desires of all kinds, one should only give up attachment to the objects of desire, and go on performing all actions.' (See Mr. Tilak's *Gītā Rahasya*, Vol. I, page 446). He observes also that 'the ultimate and most comprehensive interpretation of the canon of Self-identification is, that the highest idea of manhood and the most complete fructification of the arrangement of the four states of life consists in: (i) realising that family life is but the first lesson in the science of Self-identification, and (ii) instead of being continually engrossed in the family, making one's Self-identifying reason more and more comprehensive, by substituting one's friends, one's relations, or those born in the same gotra (clan) as oneself, or the inhabitants of one's own village, or the members of one's own community, or one's co-religionists, and ultimately all human beings, or all created beings, in the place of one's family, thereby realising that that Ātman, which is within oneself is also within all created beings; and that one should regulate one's conduct accordingly.' (Mr. Tilak's *Gītā Rahasya*, Vol. I, page 544). In a later passage Mr. Tilak says that "as there is one and the same Ātman in all created things, every one has an inherent natural right of being

highest of virtues, and अहिंसा परमो धर्मः is a familiar dictum in our sacred literature. Ahimsā means forbearance from Himsā. But what exactly is the connotation of Himsā? Himsā implies the causing of pain or suffering to sentient creatures, whether men or the lower animals. But it is not every act of this description that can be described as Himsā. It would be most appropriately rendered in English by the words, violence, injury, or cruelty. All these words carry ethical associations and a reference to standards of right and wrong, and imply the use of force without any proper reason or justification. Violence is defined by Webster as the “unjust or unwarranted use of force, with the accompaniment of vehemence, outrage or fury.” The duty to observe non-violence is not violated, if the employment of force with the incident of causing pain or suffering is warranted or justified by the circumstances. Force may be employed for various purposes; for the protection of the individual or of society or for the benefit and welfare of humanity.

ग्रामार्थं भर्तृपिण्डार्थं दीनानुग्रहकारणात् ।
वधबन्धपरिक्लेशान् कुर्वन्पापात्प्रमुच्यते ॥

—Anuśāsana, 231. 23.

“One is free from sin in killing, confining or inflicting suffering, if it is for the benefit of the village or from loyalty to the master or for the protection of the poor and the helpless.”

It may be employed for the prevention of crime, for the correction of offenders, for the education of the young, for the purpose of self-preservation (subject of course to limitations) for defence against aggression and for the preservation of the life and independence of a society or nation.

हितार्थं दुःखमन्येषां कृत्वा सुखमवाप्नुयात् ।
दण्डयन् भर्त्सयन् राजा जनान् पुण्यमवाप्नुयात् ॥
गुरुः संतर्जयन् शिष्यान् भर्ता भृत्यजनान् स्वकान् ।
उन्मार्गप्रतिपन्नांश्च शास्ता धर्मफलं लभेत् ॥
चिकित्सकश्च दुःखानि जनयन् हितमाप्नुयात् ।
यज्ञार्थं पशुहिंसां च कुर्वन्नपि न लिप्यते ॥
एवमन्ये सुमनसो हिंसकाः स्वर्गमाप्नुयुः ।

—Anuśāsana—227, 3-5.

happy in this world; and no single individual or society in the world can ever ethically acquire the right to cause the detriment of another individual or society by disregarding this universal, important and natural right, merely because the one is more than the other in numbers, or in strength, or because the one has a larger number of means than the other for conquering the other." (Mr. Tilak's *Gītā Rahasya*, Vol. I, page 559).

The practical conduct of life in the world is based upon the postulate of dualism, and until the awareness of the individual self is lost or merged in the ocean or universe of Ultimate Reality, we can only think and act in terms of dualism. Self-realisation or the realisation of the identity of the Jīva or individual soul with the Brahman or the universe is extremely rare, though conceivable. The Jīvanmukta, as he is called, can only be an approximation towards the ideal perfection; and this seems to be the view of some of the orthodox Advaitins who are not in favour of the doctrine of Jīvanmukta. Whatever ethical or metaphysical value the ideal may possess, we can only say that the endeavour of humanity must be directed to the ever-widening of our sympathies and the pursuit of universal well-being, which need not exclude the well-being of the individual.

Mr. Aldous Huxley is a recent advocate of non-attachment with all the enthusiasm of a convert. In his book on "Ends and Means" he observes: "The ideal man is the non-attached man. Non-attached to his bodily sensations and lusts. Non-attached to his craving for power and possessions. Non-attached to his anger and hatred; non-attached to his exclusive loves. Non-attached to wealth, fame, and social position. Non-attached even to science, art, speculation, philanthropy. Yes, non-attached even to these. For, like patriotism, in Nurse Cavell's phrase 'they are not enough.' Non-attachment to self and to what are called 'the things of this world' has always been associated in the teachings of the philosophers and the founders of religions with attachment to an ultimate reality greater and more significant than even the best things that this world has to offer. Of the nature of this ultimate reality I shall speak in the last chapters of this book. All that I need do in this place is to point out that the ethic of non-attachment has always been correlated with cosmologies that affirm the existence of a spiritual reality underlying the phenomenal world and imparting to it whatever value or significance it possesses." (Pages 3-4). It is not possible for me to follow him quite so far. I will only observe that he does not seem to carry his principle of non-attachment to the point of asceticism.

“For the general good, happiness may be secured by causing unhappiness to some. The king who punishes and severely warns earns merit thereby. The teacher obtains the reward of Dharma by severely admonishing his pupils, and the master by doing the same to his servants, and the ruler by punishing transgressors. The physician secures good by causing pain. Killing animals for sacrifices involves no sin. Similarly others who do harm attain heaven if they act benevolently.”

It may be required for the purpose of internal administration or as a matter of external policy in relations with foreign powers. Whether it is justifiable or not depends upon the purposes for which force is employed. For the purpose of conquest of another country and territorial aggrandisement it would not be morally justifiable. The real aim of conquest is often hidden under the masquerade of a self-imposed mission or duty to extend the benefits of civilisation or of a religion claiming a monopoly of truth. The desire to extend territory or power assumes many insidious forms. In rare cases the conquest may be justifiable on moral grounds; for example, for the suppression of cannibalism or the slave-trade, or the prevention of head-hunting as practised by certain aboriginal communities. But all pleas of this kind are open to the gravest suspicion, and must be rigorously scrutinised before accepting their validity.

The duty of Ahimsā or forbearance from the infliction of pain or injury is laid down by the Hindu books in terms which embrace not merely human beings, but also the lower animals. But the obligation cannot be interpreted as strictly in the case of the lower animals, and the observance of the duty in all cases and circumstances is neither practicable nor even possible. The question is largely discussed in our sacred books and the considerations applicable to the determination of the extent and limits of our duties to the lower animals are not altogether identical with those applicable to our relations to our fellowmen.

It must not be inferred from the generality of the terms in which the maxim of Ahimsā is laid down that it admits of no exceptions, limitations or qualifications. Maxims, whether ethical or legal, are generally only half-truths. They embody the results of our experience expressed in the form of general statements for the sake of convenience of precept. The exceptions to general rules are of a varied character and it would not be possible to embody all the exceptions and qualifications in the general rules of conduct enunciated by moralists. It must also be remembered that Hindu

law-givers and moralists resort to the method of exaggeration for the purpose of emphasising the importance of a precept. The same law-giver will be found laying down general rules in the most unqualified terms, and other rules of conduct later on which seem to be inconsistent with the general rule. It has been observed by English lawyers with reference to legal maxims that the exceptions are sometimes so numerous as to eat up the rule. The Hindu commentators were quite familiar with the principles of interpretation. They were men of common-sense and realists. They realised the importance of reconciling conflicting texts and declined to lay down impracticable rules of conduct.

I will now proceed to consider whether there is any warrant in Hindu literature for laying down the maxim of Ahimsā in unqualified terms. It is the glory of Hinduism that it preaches the virtue of Ahimsā not merely in our dealings with our fellow-men, but also in our treatment of the lower animals. It does credit to the common-sense of the Hindus that the great law-givers and moralists recognised the limitations and qualifications of this doctrine. Neither in the Vedas nor in the Smṛtis nor in the Purāṇas is the doctrine laid down in unqualified terms. There are several passages in the Bhagavad Gītā where stress is laid upon the virtue of Ahimsā. But having regard to the fact that Śrī Kṛṣṇa advises Arjuna to fight the Kauravas and wage a war against unrighteousness, there can be no doubt that the Gītā does not lay down that the doctrine of Ahimsā is to be adhered to under all circumstances and to the extent of refusing to fight when reason calls for it.

The Hindu books on polity and Nītiśāstra emphasise the importance of the employment of force for legitimate purposes, such as the preservation of law and order, and the defence of society against external aggression. Neither in theory nor in practice is there any justification for the belief that Hinduism has adopted the unqualified doctrine of non-violence. The Vedas, like many other religious books speak of wars and battles, and contain prayers for success against enemies. The use of animal food is recognised and animal sacrifices are enjoined. Coming to the age of the Smṛtis, the earliest and the most authoritative is the Smṛti of Manu. The use of animal food and the offering of animal food in the exercise of hospitality are recognised. The employment of force for the purpose of punishment of crime and prevention of anarchy is sanctioned. Daṇḍanīti figures largely in Manu and all other Dharma Śāstras. The legitimacy of the use of force for the defence and

protection of individuals, as well as for the preservation of the community or the country is declared in numerous places.

I will now cite a few texts in support of these views. In connection with the performance of the animal sacrifices enjoined in the Vedas, the question whether the killing of animals is sinful or not is discussed, and the conclusion is that cruelty or violence, even to the extent of the taking away of life, is not sinful, when it is done in the performance of a duty enjoined by religion.

या वेदविहिता हिंसा नियतास्मिंश्चराचरे ।
अहिंसामेव तां विद्यात् वेदाद्धर्मो हि निर्बभौ ॥

—*Manu*—V. 44.

“The Himsā ordained by the Vedas is inevitable in this universe. It is really (no lapse from) Ahimsā, for all true Dharma derives from the Vedas.”

The ethics of flesh-eating is discussed at length in the story of the virtuous butcher (Dharma-vyādha) in the *Mahābhārata*. A learned ascetic who had been filled with pride and conceit was advised by a lady to go to Mithilā and acquire a knowledge of Dharma from a butcher in that city. The Brahmin was unable to understand how a person who had been so highly praised for his knowledge of Dharma could reconcile himself to the trade of a butcher. The butcher told him that he was merely carrying on his hereditary occupation, that each caste had its own prescribed duties and that it was not sinful for him to follow his ancestral occupation. He also added that he did not himself kill the animals whose flesh he was selling and that he was not himself a flesh-eater. One who took meat after sacrificing to the Gods and the manes incurred no sin by the use of animal food.

देवतानां पितॄणां च भुङ्क्ते दत्त्वापि यः सदा ।
यथाविधि यथाश्रद्धं न स दुष्येत भक्षणात् ॥

—*Vana*—212, 14.

“Who-so eats flesh, after duly offering to the gods and the manes according to rule and with a sense of duty, incurs no sin.”

पितृदेवतयज्ञेषु प्रोक्षितं हविरुच्यते ।
विधिना वेददृष्टेन तद्भुक्त्वेह न दुष्यति ॥

—*Anuśāsana*—178, 17.

“What is offered to the gods and the manes is sacred offering (Havis). Whoever eats according to the ordinance of the Vedas is guilty of no sin.”

He then pointed out that many practices which involved the infliction of injury or even the destruction of life were not regarded by the world as sinful.

कृषिं साध्विति मन्यन्ते तत्र हिंसा परा स्मृता ॥
 कर्षन्तो लाङ्गलैरुर्वी घ्नन्ति भूमिशयान् बहून् ।
 जीवानन्यांश्च बहुशः तत्र किं प्रतिभाति ते ॥
 धान्यबीजानि यान्याहुर्व्रीह्यादीनि द्विजोत्तम ।
 सर्वाण्येतानि जीवा हि तत्र किं प्रतिभाति ते ॥
 अध्याक्रम्य पशूंश्चापि घ्नन्ति वै भक्षयन्ति च ।
 जीवा हि बहवो ब्रह्मन् वृक्षेषु च फलेषु च ।
 उदके बहवश्चापि तत्र किं प्रतिभाति ते ॥
 सर्वं व्याप्तमिदं ब्रह्मन् प्राणिभिः प्राणिजीवनैः ।
 सत्त्वैः सत्त्वानि जीवन्ति बहुधा द्विजसत्तम ॥
 प्राणिनोऽन्योन्यभक्षाश्च तत्र किं प्रतिभाति ते ।

—Vana—212, 22-28.

“Agriculture is deemed guiltless. It involves infliction of suffering. Ploughing kills many living beings in the earth, and many others many times. What do you think of it ?

The seeds of grains and rice and other cereals are also living things. What do you think ?

Animals are captured and eaten. And there are lives in trees and fruits and in waters. What think you of it ?

Everywhere in the world there are living beings subsisting on living beings. Beings live on other beings in many ways and even eat each other. What think you of it all, O sage ? ”

के न हिंसन्ति जीवान् वै लोकेऽस्मिन् द्विजसत्तम ।
 बहु संचिन्त्य इह वै नास्ति कश्चिदहिंसकः ॥
 अहिंसायास्तु निरता यतयो द्विजसत्तम ।
 कुर्वन्त्येव हि हिंसां ते यत्नादल्पतरा भवेत् ॥

—Vana—212, 32, 34.

“Who is there who does not inflict harm? Deeply reflecting, is there any one who can claim to be free from the charge of hurt? Even ascetics devoted to Ahimsā commit Himsā, but by great effort reduce it to the minimum.”

In the case of Kṣatriyas or members of the warrior-caste, hunting and flesh-eating were recognised as lawful.

रक्षणार्थाय भूतानां हिंसान् हन्यान्मृगान् पुनः ।

—*Anuśāsana*—178, 21.

“For the protection of life noxious animals must be killed.”

Manu says that while the use of animal food may be in accordance with natural propensities and is therefore not sinful, it is meritorious to abstain from the use of such food.

प्रवृत्तिरेषा भूतानां निवृत्तिस्तु महाफला ।

—*Manu*—V. 56.

“These (including flesh-eating) are the natural propensities of all beings. Abstinence is highly meritorious.”

संग्रामेषु न युध्यन्ते भृत्याश्चैवानुरूपतः ।

नरकं यान्ति ते घोरं भर्तृपिण्डापहारिणः ॥

—*Anuśāsana*—214—35.

“Those who are paid for military service and who refuse to fight in wars—they are not true to the salt they eat, and as disloyal traitors to their masters, they undergo terrible torments in hell.”

The killing of animals in the chase is wanton cruelty and is condemned by the enlightened conscience of the modern age, though it is regarded as lawful sport in Western countries and even in India. The pleasures of the chase are described by the Sanskrit poets who extol its merits not merely as an exciting pastime, but as a means of promoting physical alertness, efficiency and health and skill in marksmanship. While there can be no justification from an ethical point of view for the practice of hunting or angling, it will be generally admitted that the killing of wild animals, vermin and other noxious creatures, whether in self-defence or for the protection of human life or property needs no justification. Our judgment as to the lawfulness or propriety of the destruction of living creatures in these cases depends upon the postulate of the superior value of human life. The same line of reasoning and thought will

justify the destruction of, or injury to, the lower animals without the infliction of any avoidable suffering, for the purpose of discovering remedies against diseases affecting mankind and for the advancement of scientific research.*

We may now pass on to consider the lawfulness of the employment of Himsā in our relations with our fellow-beings. If the employment of force or violence is contrary to the spirit of Hinduism in the case of the lower animals, it is even more so in the case of human beings. But is there any warrant for the view that it is prohibited in all cases and that the obligation to refrain from violence is universal and unqualified? A little reflection will show that the maxim of Ahimsā cannot be recognised or applied as an invariable rule of conduct. There are circumstances in which the employment of force is justifiable or becomes a matter of duty. In such cases it would be improper to characterise the use of force as violence. It cannot possibly fall within the definition of violence or Himsā. Whether the use of force is morally justifiable or not depends upon the purpose for which force is employed. The subject is considered at length in the Hindu treatises on ethics, law and polity, and they recognise the right of private defence in terms not less liberal than the Indian Penal Code.

*It is interesting to note that while the ideals of Hinduism on the subject of our duties to the lower animals are far higher than those of any other religion, the practical conclusions of the Hindus are not different from those expressed by an eminent Christian divine.

"But have we a right to enslave them (animals), to kill and eat them, to cut them open for purposes of medical research, and to hunt and shoot them for our amusement? These are not easy questions to answer, and I cannot argue for or against these practices in this book. My own attitude may be inconsistent: I cannot help that. We have, I think, a right to make the animals supply our needs, on condition of treating them kindly; we have a right to kill and eat them, for creatures which are not useful for food will not long be suffered to exist at all; we have a right to vivisection under anaesthetics, but only if there is no other way of acquiring medical knowledge, and if no unnecessary pain is inflicted; but to take a pleasure in killing our helpless cousins for fur and feathers seems to me a disgusting relic of barbarism. Personally, I have never killed anything larger than a wasp, and that was in self-defence. It is not necessary or possible to draw hard and fast lines; what is necessary is that we should recognise that the animals have as good a right on the earth as we have; that 'our heavenly Father feedeth them,' and wishes them to have such happiness as they are capable of; and that they are, in fact and not in metaphor, our own kith and kin."

—(Dean Inge: *Christian Ethics and Modern Problems*, p. 286).

गुरुं वा बालवृद्धौ वा ब्राह्मणं वा बहुश्रुतम् ।

आततायिनमायान्तं हन्यादेवाविचारयन् ॥

—*Manu*—VIII, 350.

“One may slay without hesitation a murderous assailant, even if he be the teacher or an old or young person, or even a learned Brahmin.”

आततायिनमायान्तं अपि वेदान्तपारगम् ।

जिघांसन्तं जिघांसीयान्न तेन भ्रूणहा भवेत् ॥

—*Sānti*—14, 89.

“A murderous assailant may be killed even though he be the most learned Brahmin. Such killing is no murder.”

The punishment of offenders is one of the essential duties of kings for the maintenance of law and order (see Chapter VIII of *Manu*).

When the employment of force for private defence and other purposes is recognised by the Hindu Dharma-Śāstra, it goes without saying that it is even more justifiable for the protection of a country against aggression.

In the Hindu books on polity, even the conquest of other kingdoms and countries is referred to with approval. There could therefore be no question as to the lawfulness of the use of force to resist aggression.

The teaching of the *Gītā* is undoubtedly in favour of fighting against unrighteousness not by means of non-violence but by recourse to arms. Whatever may be the rules of conduct applicable to ascetics or hermits who have retired from the world and who may not concern themselves with the welfare of organised societies, one who lives in society is not justified in adopting rules of conduct applicable to those who have renounced the world. The citizen of a State is under an obligation to resist aggression by taking arms, if necessary and possible.

The duty of observing Ahimsā is laid down in much more stringent terms in Jainism and Buddhism than in Hinduism, and it is very often carried to ridiculous lengths. “To what lengths this dread of life-taking was carried appears from an order that only filtered water was to be given to all animals employed in the royal

